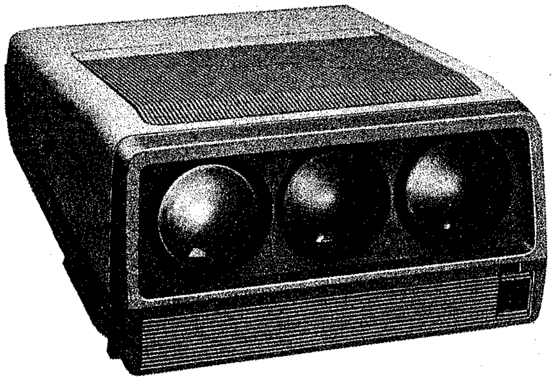
VPH-1251QM
RM-1271

SERVICE MANUAL

AEP Model

Chassis No. SCC-D13C-A



SuperData

Note: The service manual for RM-1271 has been issued separatly.

MODELS OF THE SAME SERIES	
VPH-1251QM	
VPH-1271QM	

SPECIFICATIONS

Optical

Projection system	3 picture tubes, 3 lenses, Horizontal inline system
Picture tube	7-inch new high-brightness monochrome tubes, with coolant sealed
Projection lens	HACC (High-resolution Aspherical and Color Corrected) lenses F 1.12/140mm
Projected picture size	Factory-adjusted to 120 inches measured diagonally 70-300 inches measured diagonally adjustable by changing the parts
Light output	650 lm (white peak) 200 lm (all white)

General

Color system	PAL, SECAM, NTSC and $\text{NTSC}_{4.43}$ systems, switched automatically
Resolution	700 TV lines (VIDEO input) 1280x1024 pixels (RGB input at f_H: 40kHz, f_v: 38Hz)
RGB inputs	Horizontal frequency 15kHz-58kHz Vertical frequency 38Hz-150Hz
Test signal	Cross-hair test pattern generator is incorporated.
Speaker	4x8cm (1 5/8x3 1/4 inches), 3W
Input	VIDEO IN Y/C: 4-pin mini DIN connector Y (luminance) signal: 1 Vp-p ±2dB, sync negative, 75 ohms terminated C (chrominance) signal: burst 0.286 Vp-p±2dB, 75 ohms terminated (NTSC) 0.3 Vp-p±2dB, 75 ohms terminated (PAL)

— continued on next page —

MICROFILM

MULTISCAN PROJECTOR

SONY®

	VIDEO: BNC connector Composite video input, 1 Vp-p ±2dB, sync negative, 75 ohms terminated. AUDIO IN phono jack 500 m Vrms, Impedance: more than 47 k ohms **RGB input** R: BNC connector Red input, 0.7 Vp-p ±2dB, 75 ohms terminated, positive G/G SYNC: BNC connector Green input, 0.7Vp-p ±2dB, 75 ohms terminated, positive Green with sync input, 1Vp-p ±2dB, 75 ohms terminated, positive B: BNC connector Blue input, 0.7Vp-p ±2dB, 75 ohms terminated, positive SYNC/HD: BNC connector Composite sync input, 0.3–8Vp-p, high impedance, positive/negative Horizontal sync input, 0.3–8Vp-p, high impedance, positive/negative VD: BNC connector Vertical sync input, 0.3–8Vp-p, high impedance, positive/negative Width: wider than horizontal period (1H) AUDIO IN L(MONO)/R: phone jacks REMOTE 1 connector: 14-pin (see "Signal assignment") REMOTE 2 connector: 9-pin (see "Signal assignment") CONTROL S IN: minijack, 5Vp-p
Outputs	VIDEO OUT: BNC connector Composite video output, 1Vp-p ±2dB, impedance 75 ohms, output video signal from the VIDEO IN connector CONTROL S OUT: minijack, 5Vp-p
Power requirements	220-240 V AC, 50/60Hz
Power consumption	VPH-1251QM: 440 W
Operating temperature	–10°C –+40°C (humidity: 10% –90%)
Storage temperature	–20°C –+60°C (humidity: 10% –90%)
Dimensions	Approx. 620x355x817mm (w/h/d) (24 1/2x14x32 1/4 inches)
Weight	VPH-1251QM: 64 kg
Accessories supplied	Remote Commander RM-1271 (1) with 3 R6 (AA) batteries Remote Commander cable (1) AC power cord (1) Washer for optical axis adjustment (12 each for 4 sorts of thickness) CRT spacers (1set each for the size S and L) Spacer for rear projection (1 set each for the angles of optical axis 0° and 2°)

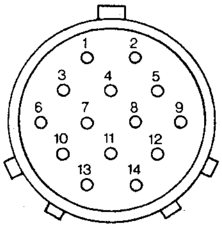
Accessories (not supplied)

Signal interface switcher	PC-1271M
Projector suspension support	PSS-1270, PSS-10
Screen	VPS-100F1 (100" flat) VPS-120F (120" flat) VPS-72HG1 (72" curved) VPS-100HG1 (100" curved) VPS-700R (70" rear projection)
CCQ BRS cables	
Interface board	IFB-11 (5BNC, Analogue) IFB-20 (9-pin, Analogue) IFB-1000 (Video, Y/C) IFB-30 (9-pin, Digital) IFB-101

Signal assignment

REMOTE 1 connector (14-pin)

Pin No.	Signal
1	GND
2	HD/Composite Sync
3	SIRCS
4	NC
5	GND(SIRCS)
6	B/C
7	GND(B/C)
8	GND(G/Y)
9	G/Y
10	RGB/Video
11	R/Composite Video
12	Composite Video/YC
13	AUDIO
14	VD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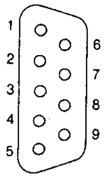
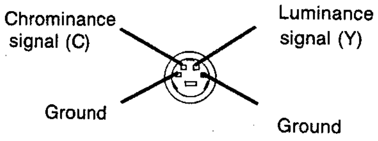
REMOTE 2 connector (D-sub 9-pin)

Pin No.	Signal
1	Frame Ground
2	$\overline{\text{Transit A}}$
3	Receive B
4	Receive Common
5	Spare
6	Transmit Common
7	Transmit B
8	$\overline{\text{Receive A}}$
9	Frame Ground

RS-422 format



Y/C connector (4-pin mini DIN)


Chrominance signal (C)
Luminance signal (Y)
Ground
Ground

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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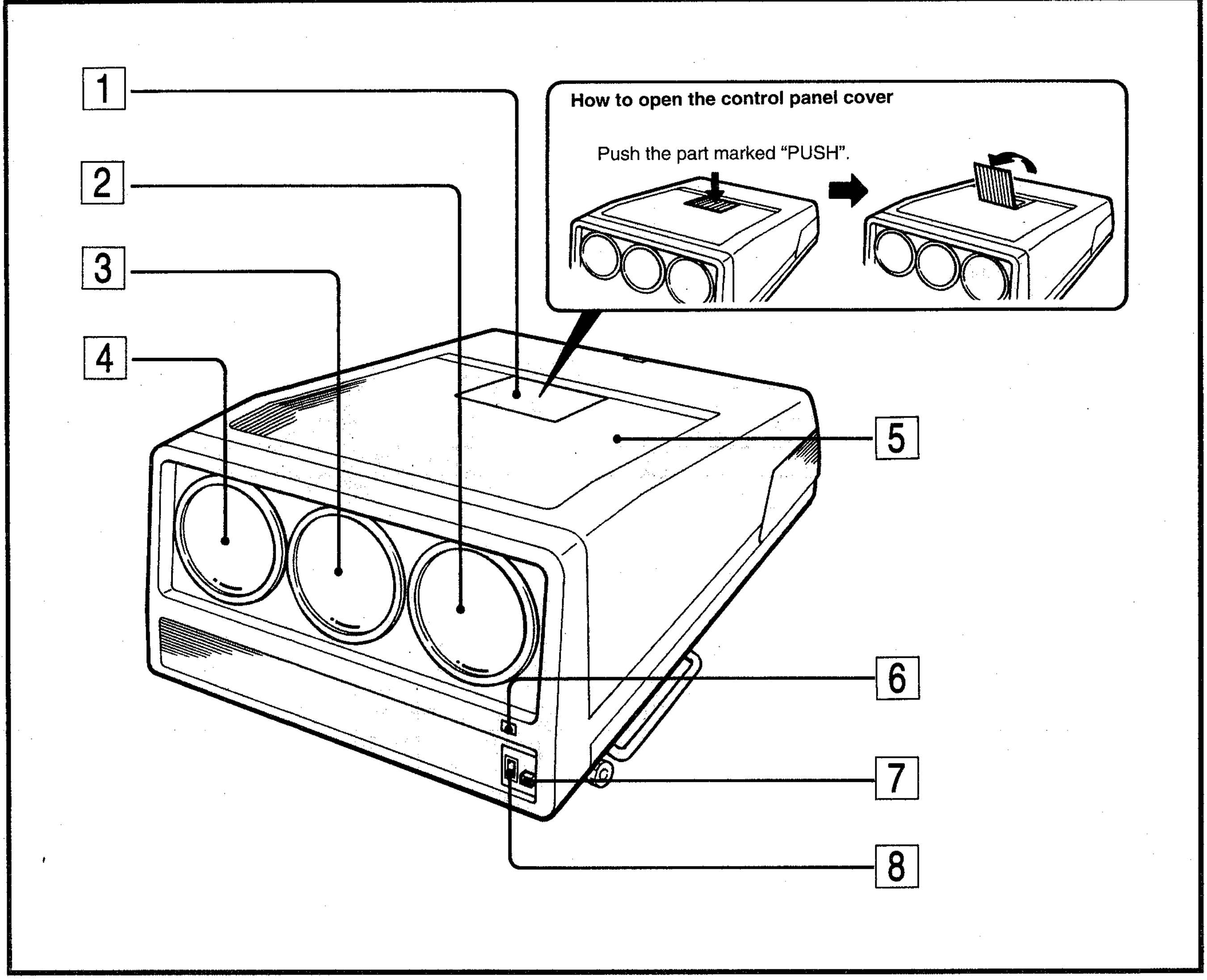
SECTION 1
GENERAL

1-1. LOCATION AND FUNCTION OF CONTROLS

Front



How to open the control panel cover

Push the part marked "PUSH".

1 **Control panel**
There are the control keys inside the panel.

2 **Red lens**

3 **Green lens**

4 **Blue lens**

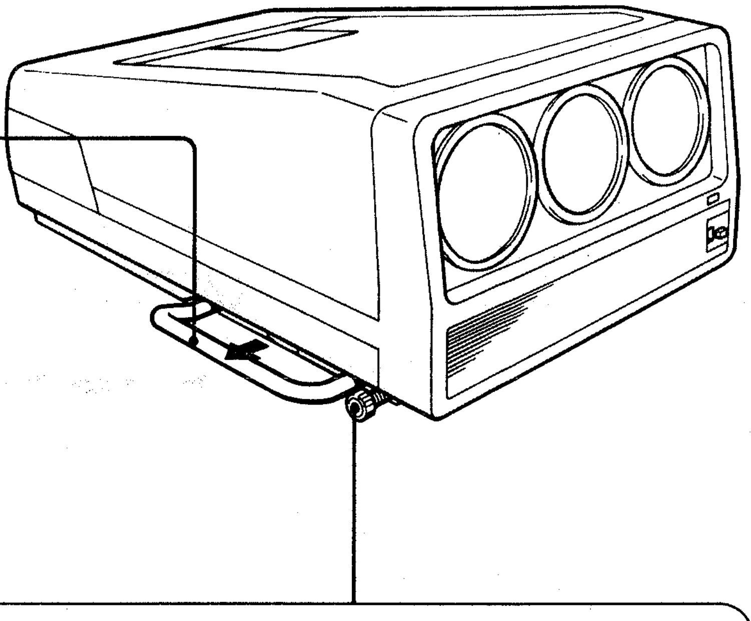
5 **Speaker**

6 **Front remote control detector**

7 **MAIN POWER switch (▁ ON/ ▮ OFF)**
Press to turn on and off the main power.

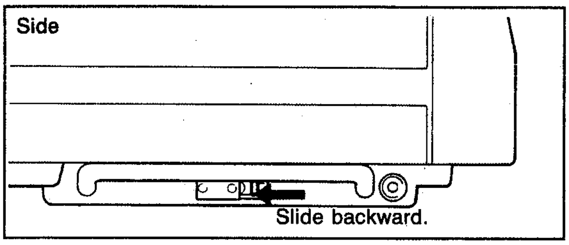
8 **AC IN socket**
Connect the supplied AC power cord (mains lead).

Bottom



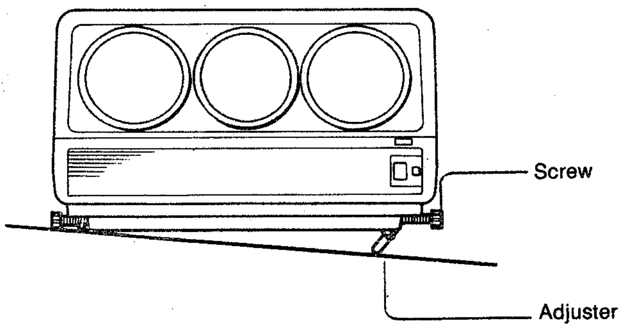
Handle
Used for carrying the projector. Pull out to use.

Putting the handle away



How to use the adjusters

The horizontal tilt of the projector can be adjusted using the adjusters.

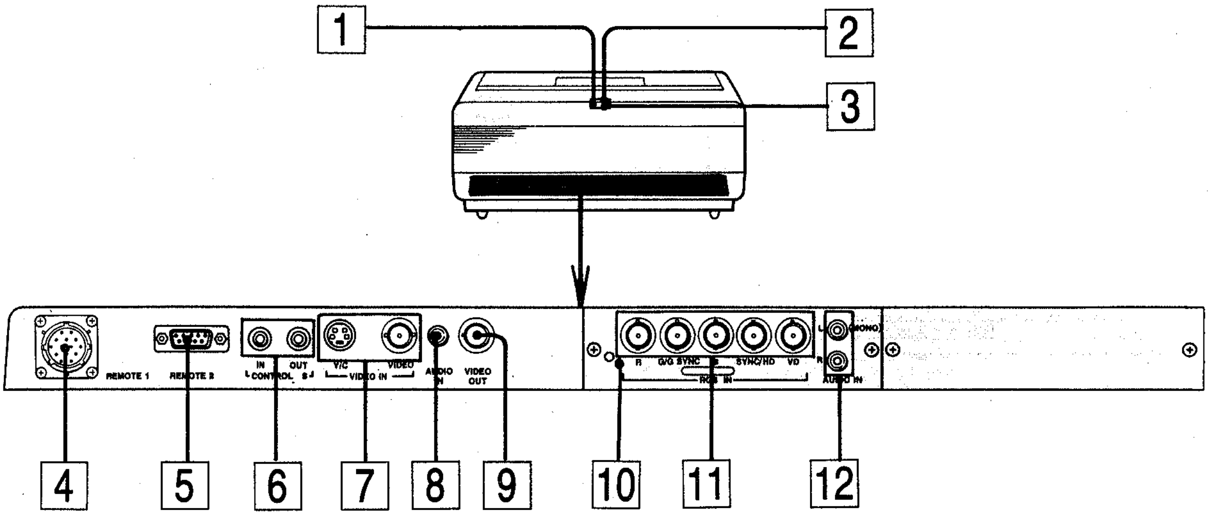


1. **While lifting the projector using a handle, turn the screw to the left.**
   Adjuster comes out.
   By using the philips-head screwdriver, you can turn the screw without lifting the projector.

2. **Adjust the height.**
   If it is too high, turn the screw to the right to lower the projector.
   If it is too low, lift the projector again and turn the screw to the left to heighten the projector.

To retract the adjusters
Tighten the screw by turning to the right.
When the screw is tightened completely, the adjusters are locked and put away.
Retract the adjusters when carrying the projector.

Rear


1
2
3
REMOTE 1
REMOTE 2
IN
OUT
CONTROL S
Y/C
VIDEO
VIDEO IN
AUDIO IN
VIDEO OUT
R
G/G SYNC
B
SYNC/HD
VD
RGB IN
L (MONO)
R
AUDIO IN
4
5
6
7
8
9
10
11
12

1 **Rear remote control detector**

2 **POWER indicator**
Green indicator is on when the power is turned on.

3 **STANDBY indicator**
When the MAIN POWER switch is on, the red light indicating standby will be on. When the red light is on, the projector can be controlled with the Remote Commander.

Note
When the MAIN POWER switch is turned off, there will be a slight delay before the red light goes off.

4 **REMOTE 1 connector (14-pin)**
Connect to the REMOTE 1 connector of the PC-1271M switcher (not supplied).

5 **REMOTE 2 connector (9-pin)**
Connect RS-422 interface for interactive communication with the external equipment. Take off the red cap before use.

6 **CONTROL S IN/OUT connectors**
Connect to the CONTROL S connectors of other Sony equipment.
CONTROL S IN: Connect to the CONTROL S OUT connector of the supplied Remote Commander to use as a wired Commander.

7 **VIDEO IN connectors**
Y/C (4-pin): Connect to the Y/C output of a VTR.
VIDEO (BNC type): Connect to the video output of video equipment.

Note
The VIDEO connector is disconnected automatically when a cable is connected to the Y/C connector.

8 **AUDIO IN jack (phono)**
Connect to the audio output of video equipment.

9 **VIDEO OUT connector (BNC type)**
Connect to the video input of a color monitor. The signal input from the Y/C connector is not output from this connector.

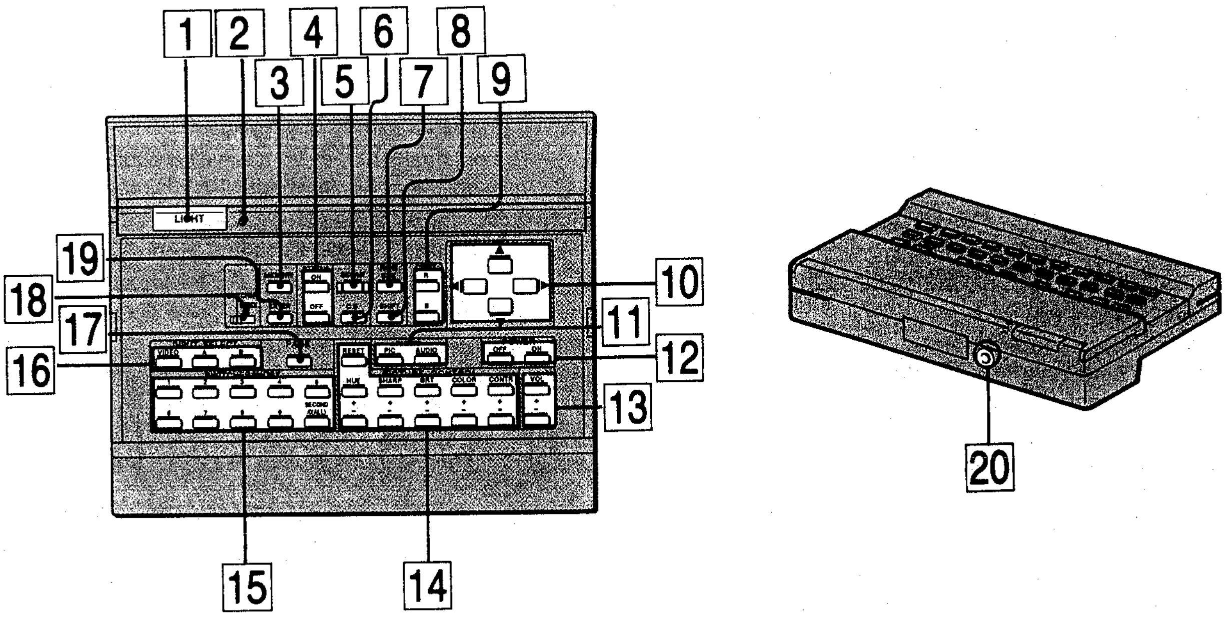
10 **Indicator**
Lights when INPUT A mode is selected.
The optional interface board is also equipped with this indicator which lights when INPUT B mode is selected.

11 **RGB IN connectors (BNC type)**
R, G/G SYNC, B, SYNC/HD, VD connectors:
Connect to the RGB outputs of a computer or a video camera.

12 **AUDIO L/R IN jacks (phono)**
Connect to the audio output of a computer or a video camera connected to the RGB IN connectors. For stereo equipment, use the AUDIO L and R IN jacks. For monaural equipment, use the AUDIO L IN jack only.

Note
The projector is monaural so that sound will not be reproduced in stereo.

Remote Commander RM-1271



1 **LIGHT button**
Press to light key indicators.
If the keys are not operated within about 30 seconds, the light automatically goes out.

2 **Transmission indicator**
The light goes on each time a key is pressed. When the indicator does not light, replace the batteries.

3 **MEMORY key**
Press to store various adjustment data into memory.

4 **STATUS ON/OFF key**
Press **OFF** to eliminate the on-screen display.
Press **ON** to restore the on-screen display.
Note: The PAGE display appears even when the **OFF** key is pressed.

5 **SECAM key**
When SECAM signal is input to the projector and you cannot get normal color, press this key. Press again to switch over to the other standard system sources, NTSC or PAL.

6 **C.B. (clear blue) key**
Press to make the blue color clear in RGB mode. Press again to restore the normal condition.

7 **RGB SIZE key**
Press to adjust the size of the picture for the video and RGB signal inputs.
Press this key to enter the size adjustment mode. The size adjustment is performed using the four arrow keys.
▶ ..... to reduce the horizontal size
◀ ..... to expand the horizontal size
▲ ..... to expand the vertical size
▼ ..... to reduce the vertical size

8 **RGB SHIFT key**
Press to adjust the shift of the picture for the RGB signal input.
Press this key to enter the shift adjustment mode. The shift adjustment of the picture is performed using the four arrow keys. The picture shifts according to the direction of the arrow.
Note
This key does not function with the video signal input.

9 **CENT R/B keys**
Press to enter the centering adjustment mode of the red and blue.
CENT R: Press to enter the red centering adjustment mode.
CENT B: Press to enter the blue centering adjustment mode.
Centering adjustments are performed using the four arrow keys.
To return to the normal display, press the MEMORY key.

10 Arrow keys
The keys are used for various adjustment functions.

11 PJ MUTE keys
PIC: Press to cut off the picture. To restore the picture, press it again or CONTR +.
AUDIO: Press to cut off the sound. To restore the sound, press it again or VOL +.

12 POWER ON/OFF keys
Press to turn on and off the projector.

13 VOL (volume) +/– keys
Press to adjust volume.
+: to increase volume
–: to decrease volume

14 PICTURE CONTROL keys
Press to adjust picture condition: hue, sharpness, brightness, color and contrast. Press RESET to restore the standard levels.

15 SWITCHER/INDEX keys
When the SWITCHER/INDEX select switch is set to SWITCHER
When the PC-1271M switcher is connected, select the input from the switcher. The SECOND key is used when two switchers are connected. To select the input from the second switcher (when the switcher's SINGLE/REMOTE 2/SECOND switch is set to SECOND), press the number keys after pressing SECOND. Number key 9 does not operate.
When the SWITCHER/INDEX select switch is set to INDEX
These keys function when the IFB-101 interface board (not supplied) is attached and multiple projectors are connected. For details, refer to the instructions manual of the IFB-101.

16 INPUT SELECT keys
Press to select the input signal.
VIDEO: to select the signal input from the VIDEO IN (Y/C or VIDEO) connectors
A: to select the signal input from the RGB IN connectors
B: to select the signal input from the connectors of B section (when the optional interface board is attached)

17 PAGE key
Press to display and switch the following five on-screen displays. (On PAGE 1, 2, 3 and 5*, adjustment can also be done.)
PAGE 1: Displays STATUS ON/OFF, PIC MUTE ON/OFF, AUDIO MUTE ON/OFF, CLEAR BLUE ON/OFF and SECAM ON/OFF.
PAGE 2: Displays the picture conditions; contrast, color, brightness, sharpness and hue, and volume level.
PAGE 3: Displays the color temperature level, clamp setting and vertical shift range.
PAGE 4: Displays the input signal conditions; fH, fV H/C-sync, V-sync, Sync on Green and input signal and registration memory block assignment.
***PAGE 5:** Displays the current use time of each cathode-ray tube (CRT) and the baud rate setting for communicating via the RS-422.

18 SWITCHER/INDEX select switch
Selects the SWITCHER/INDEX key function.
When using as the switcher input selector, set to SWITCHER.
When attaching the IFB-101 interface board (not supplied) on the control panel of the projector and controlling multiple projectors, set to INDEX.

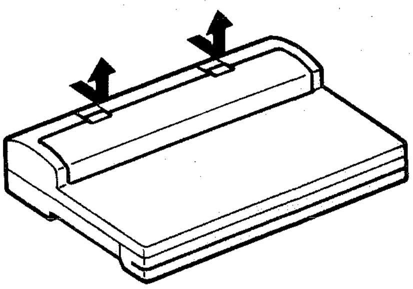
19 ENTER key
This key functions when the IFB-101 interface board (not supplied) is attached and multiple projectors are connected. For details, refer to the instructions manual of the IFB-101.

20 CONTROL S OUT connector
Connect the supplied remote control cable to this connector and to the CONTROL S IN connector of the projector for wired Commander application.

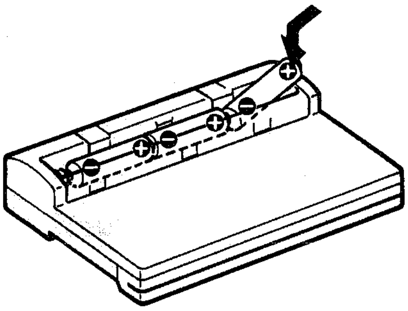
* Only the service-man mode.

Battery installation

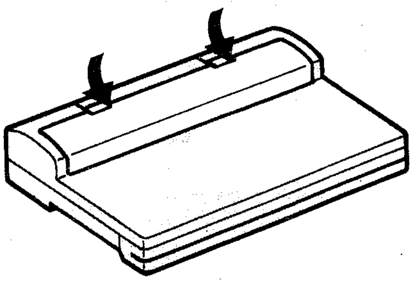
1 Push to open the lid.



2 Install three R6 (AA) batteries with the correct polarity.

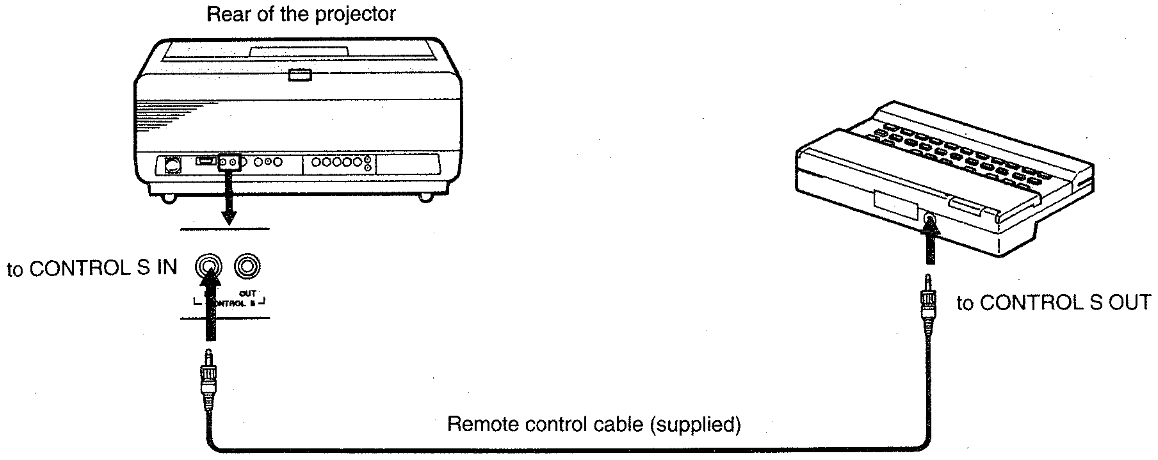


3 Replace the lid.



- If the projector does not operate properly, the batteries might be worn out. Replace all three of them with new batteries.
- The life of the batteries depends on frequency of usage and how often you use the LIGHT button. If they wear out quickly, replace them with new alkaline batteries.
- To avoid damage from possible battery leakage, remove the batteries when the Commander will not be used for a long time.
- Be sure that there are no obstructions between the Commander and the unit.
- Operable range is limited. The shorter the distance between the Commander and the projector, the wider the angle within which the Commander can control the projector.

To connect the Remote Commander to the projector



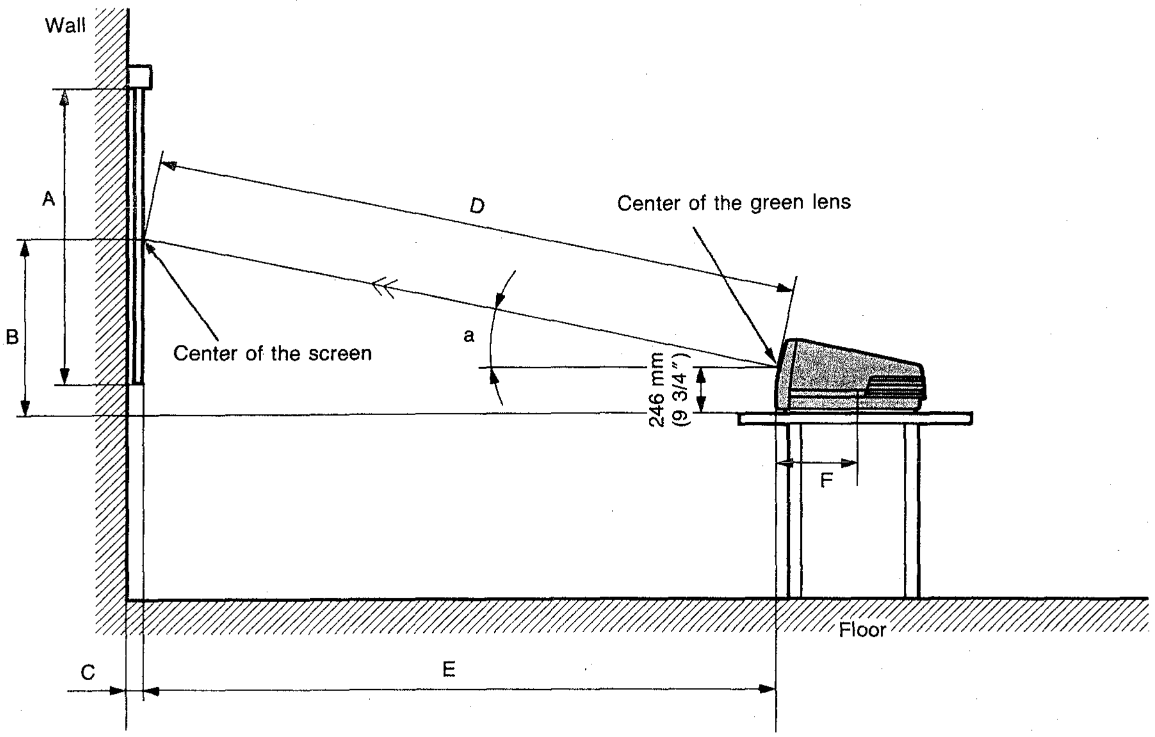
Note

When the above connection is made, the remote control detector of the projector does not function. For wireless operation, be sure to disconnect both plugs from the projector and the Commander.

1-2. INSTALLATION DIAGRAMS

Floor Installation Using Front Projection Flat Screen

Be sure that the projector is parallel to the floor.



E: Distance between the center of the screen and the center of the green lens
F: Distance between the center hole and the center of the green lens
B: Distance between the projector's bottom surface and the center of the screen

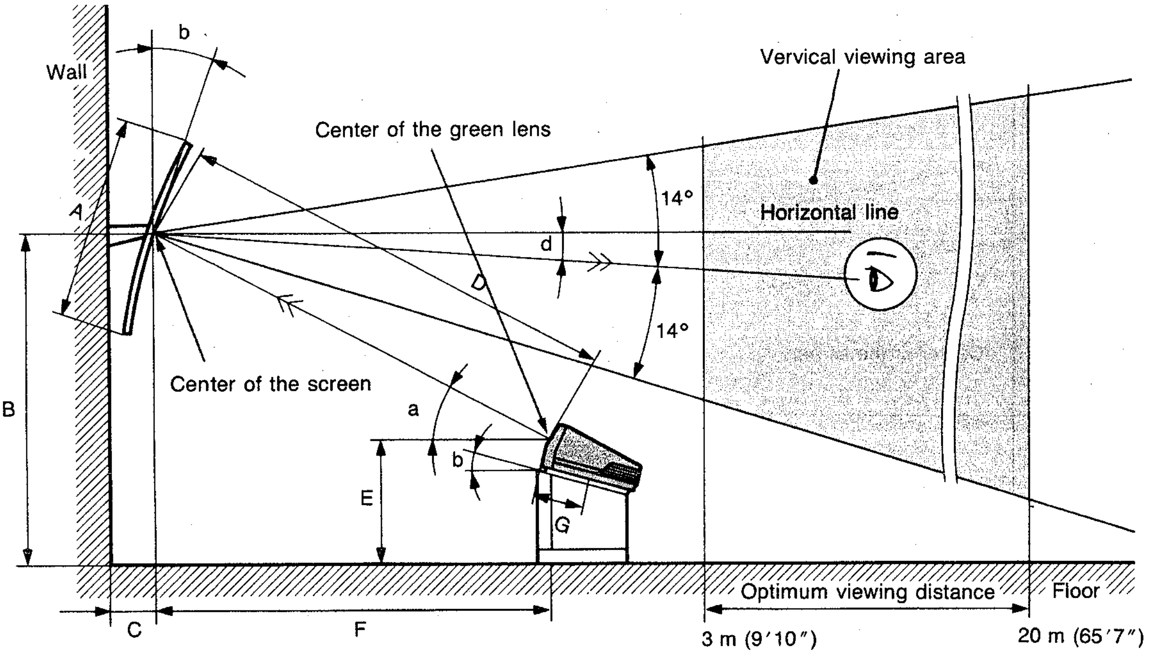
Tolerance in length
B: ±5%
Other measurements: −1% — +5%

Screen size (inches)	Length mm (inches)						Angle (°)
	A	B	C	D	E	F	a
70	1,067 (42 1/8)	743 (29 3/8)		2,056 (81)	1,995 (78 5/8)	297 (11 3/4)	14.0
80	1,219 (48 1/8)	908 (35 3/4)		2,326 (91 3/4)	2,257 (89)	296 (11 3/4)	14.0
100*	1,524 (60)	960 (37 7/8)	24 (31/32)	2,859 (112 3/4)	2,769 (109 1/4)	293 (11 5/8)	14.5
120**	1,829 (72 1/4)	1,091 (43)	35 (1 7/16)	3,386 (133)	3,279 (129 3/8)	291 (11 1/2)	14.5
150	2,286 (90 1/4)	1,319 (52)		4,204 (165 3/4)	4,065 (160 1/8)	288 (11 3/8)	14.8
180	2,743 (108)	1,517 (59 3/4)		4,981 (147 3/8)	4,816 (190)	286 (11 3/8)	14.8
200	3,048 (120)	1,653 (65 1/8)		5,516 (163 1/8)	5,334 (210)	285 (11 1/4)	14.8
250	3,810 (150 3/8)	1,997 (78 3/4)		6,862 (220 5/8)	6,635 (261 1/4)	284 (11 1/4)	14.8
300	4,572 (180)	2,343 (92 3/8)		8,208 (323 1/4)	7,935 (312 1/2)	283 (11 1/4)	14.8

*Sony VPS-100F1
**Sony VPS-120F

Necessary modifications of parts
• Spacer change (not necessary for use of the 100- and 120-inch screens)

Floor Installation Using Front Projection Curved Screen


Wall
b
A
Center of the green lens
Vervical viewing area
Horizontal line
14°
d
D
14°
Center of the screen
a
b
B
E
G
C
F
Optimum viewing distance
Floor
3 m (9′10″)
20 m (65′7″)

G: Distance between the center hole and the center of the green lens
d: The picture is brightest in this area.

Tolerance in length
D: −1% — +5%
Other measurements: ±5%

Screen size (inches)	Length mm (inches)							Angle (°)		
	A	B	C	D	E	F	G	a	b	d
72*	1,125 (44 3/8)	1,886 (74 1/2)	184 (7 1/4)	2,180 (86)	739 (29 1/8)	1,854 (73)	297 (11 3/4)	31.7	18.1	4.5
100**	1,600 (63)	2,107 (83)	303 (12)	3,002 (118 1/4)	545 (21 1/2)	2,564 (101)	293 (11 5/8)	31.4	17.4	3.4

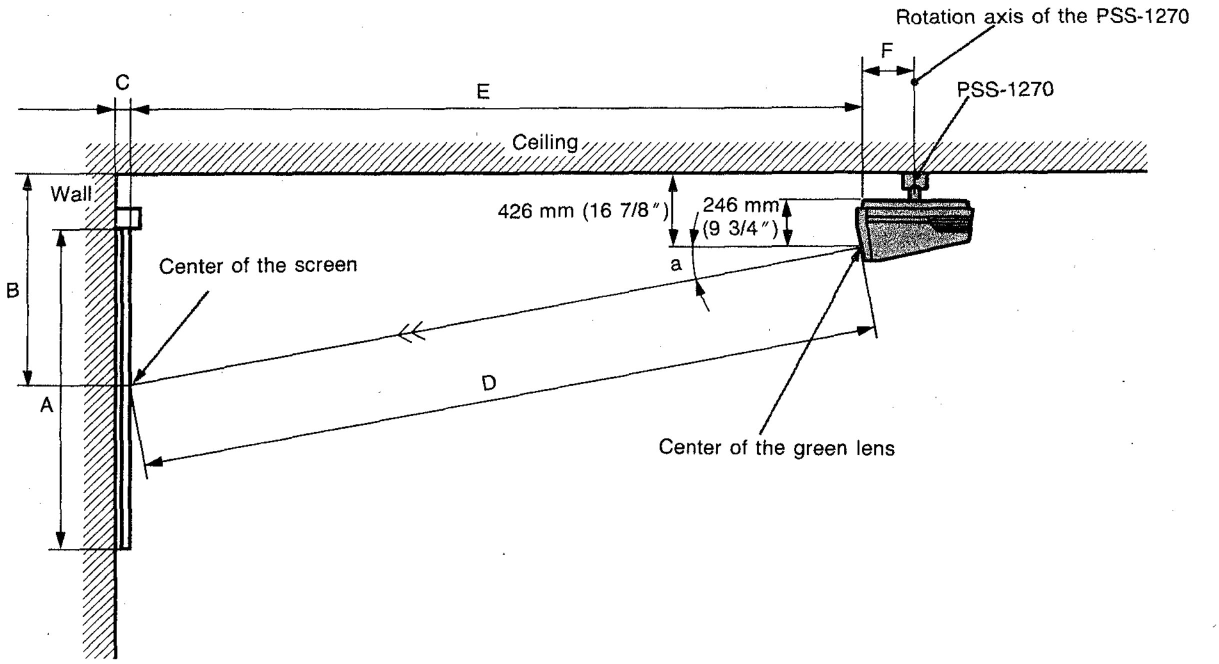
*Sony VPS-72HG1
**Sony VPS-100HG1

Necessary modifications of parts

- Spacer change (only for use of the 72-inch screen)

Ceiling Installation Using Front Projection Flat Screen

Be sure that the projector is parallel to the ceiling.


Rotation axis of the PSS-1270
F
C
E
PSS-1270
Ceiling
Wall
426 mm (16 7/8″)
246 mm
(9 3/4″)
B
Center of the screen
a
A
D
Center of the green lens

E: Distance between the center of the screen and the center of the green lens

Tolerance in length
B: ±5%
Other measurements: −1% — +5%

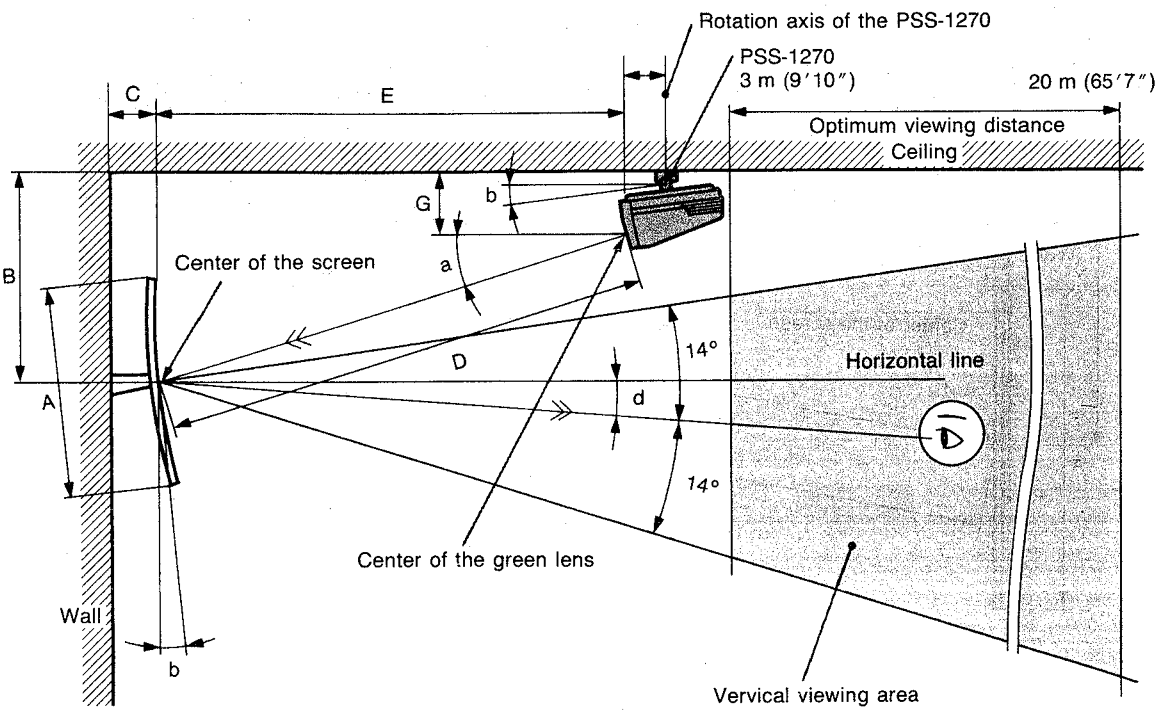
Screen size (inches)	Length mm (inches)						Angle (°)
	A	B	C	D	E	F	a
70	1,067 (42 1/8)	923 (36 3/8)		2,056 (81)	1,995 (78 5/8)	323 (12 3/4)	14.0
80	1,219 (48 1/8)	988 (39)		2,326 (91 3/4)	2,257 (89)	320 (12 5/8)	14.0
100*	1,524 (60)	1,140 (45)	24 (31/32)	2,859 (112 3/4)	2,769 (109 1/4)	318 (12 5/8)	14.5
120**	1,829 (72 1/4)	1,271 (50 1/8)	35 (1 7/16)	3,386 (133)	3,279 (129 3/8)	316 (12 1/2)	14.5
150	2,286 (90 1/4)	1,499 (59 1/8)		4,204 (165 3/4)	4,065 (160 1/8)	314 (12 3/8)	14.8
180	2,743 (108)	1,697 (67)		4,981 (147 3/8)	4,816 (190)	312 (12 3/8)	14.8
200	3,048 (120)	1,833 (72 1/4)		5,516 (163 1/8)	5,334 (210)	310 (12 1/4)	14.8
250	3,810 (150 3/8)	2,177 (85 3/4)		6,862 (220 5/8)	6,635 (261 1/4)	308 (12 1/4)	14.8
300	4.572 (180)	2,523 (99 3/8)		8,208 (323 1/4)	7,935 (312 1/2)	306 (12 1/8)	14.8

*Sony VPS-100F1
**Sony VPS-120F

Necessary modifications of parts

- Spacer change (not necessary for use of 100- and 120-inch screens)
- Polarity change on the DC and E boards

Ceiling Installation Using Front Projection Curved Screen


Rotation axis of the PSS-1270
PSS-1270
3 m (9′10″)
20 m (65′7″)
C
E
Optimum viewing distance
Ceiling
G
b
B
Center of the screen
a
A
D
14°
Horizontal line
d
14°
Center of the green lens
Wall
b
Vervical viewing area

E: Distance between the center of the screen and the center of the green lens
d: The picture is brightest in this area.

Tolerance in length
D: −1% — +5%
Other measurements: ±5%

Screen size (inches)	Length mm (inches)							Angle (°)		
	A	B	C	D	E	F	G	a	b	d
72*	1,125 (44 3/8)	1,271 (50 1/8)	185 (7 3/8)	2,180 (86)	2,025 (79 3/4)	267 (10 5/8)	464 (18 3/8)	21.7	8.1	5.5
100**	1,600 (63)	1,639 (64 3/4)	305 (12 1/8)	3,002 (118 1/4)	2,764 (109)	255 (10 1/8)	467 (18 1/2)	23.0	9.0	5.0

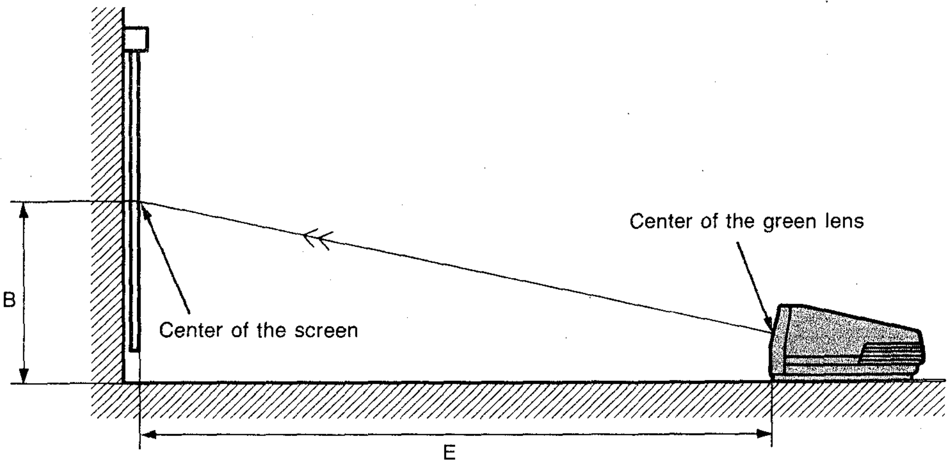
*Sony VPS-72HG1
**Sony VPS-100HG1

Necessary modifications of parts

- Spacer change (only for use of the 72-inch screen)
- Polarity change on the DC and E boards

When the Screen Size is Not Mentioned in the Tables

When using the front projection screen for both floor and ceiling installations, the installation measurements can be calculated as follows:



E: Projection distance
B: Screen height

When the screen size is between 70 and 85 inches
E (mm) = 25.78 × Screen size + 191
B (mm) = Value E (mm) × 0.249 + 246
Example: 75-inch screen
E = 25.78 × 75 + 191 = 2,125 mm
B = 2,125 × 0.249 + 246 = 775 mm

When the screen size is between 86 and 139 inches
E (mm) = 25.78 × Screen size + 191
B (mm) = Value E (mm) × 0.258 + 246

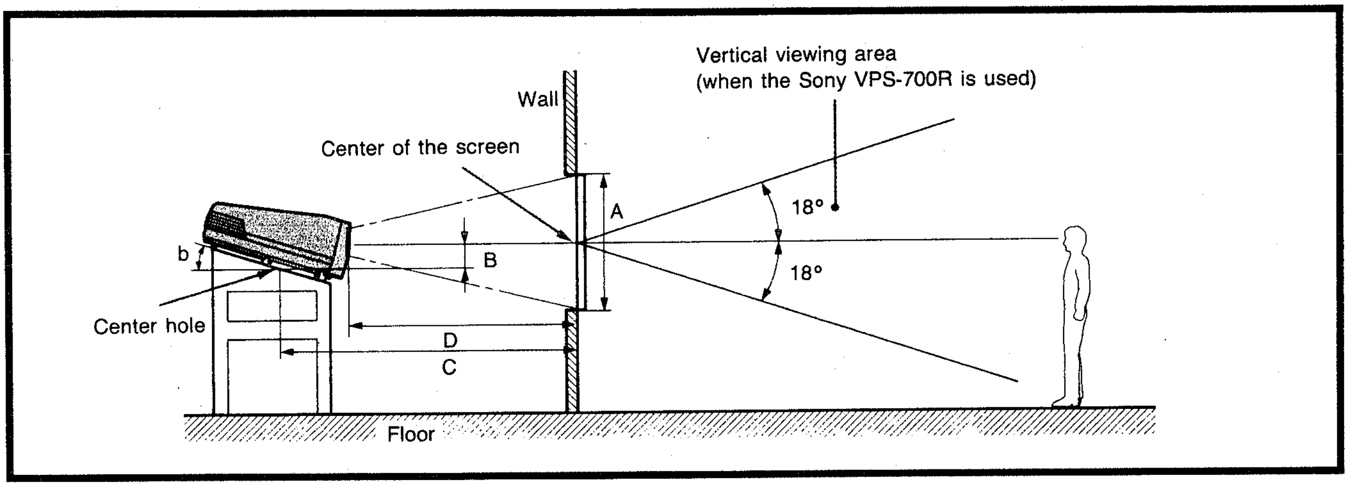
When the screen size is between 140 and 300 inches
E (mm) = 25.78 × Screen size + 191
B (mm) = Value E (mm) × 0.264 + 246

Floor Installation Using Rear Projection Flat Screen

What is the angle of optical axis?
The angle of optical axis is the angle between the horizontal line which is level with the center of the screen and the straight line from the center of the projector's green lens to the center of the screen. When a rear projection screen is used, you can get the brightest picture along the extension of the straight line between the center of the green lens and the center of the screen.

Therefore, the most suitable angle of optical axis (a) varies depending on the height of the screen and the line of your sight.
A standard rear projection installation is that wherein this angle is 0° or 2°.

When the angle of optical axis is 0°



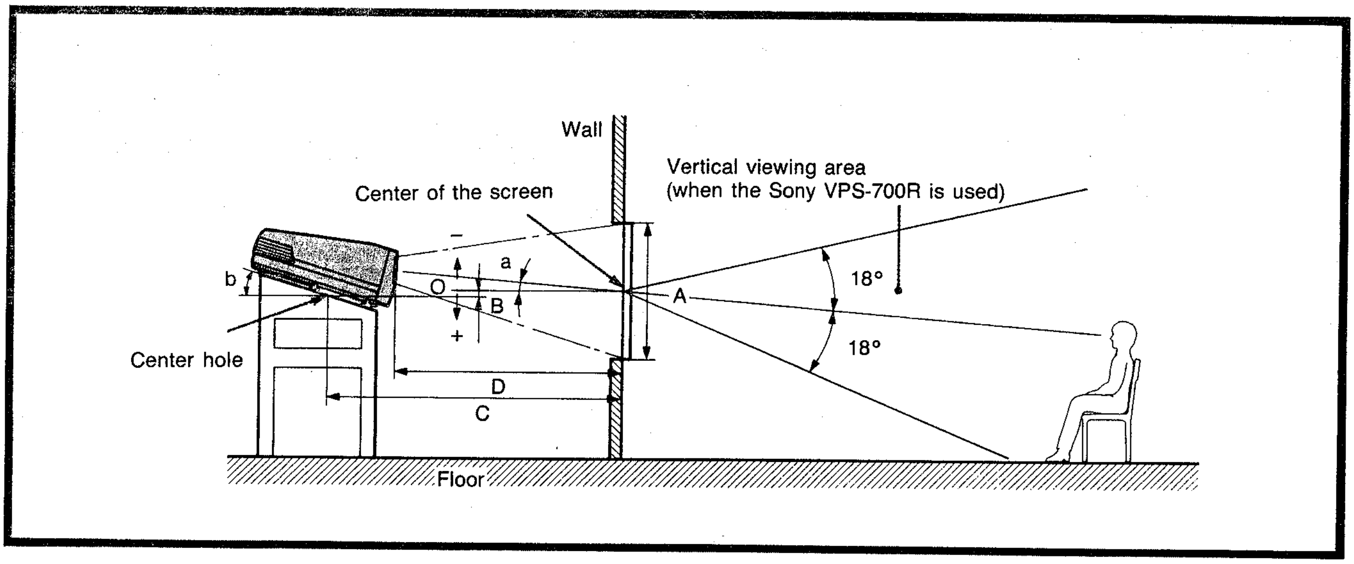
a = 0° (b = 13.4° ± 0.5°)

Screen size (inches)	Length mm (inches)			
	A	B	C	D
70	1,067 (42 1/8)	174 (6 7/8)	2,384 (93 7/8)	2,037 (80 1/4)
80	1,219 (48 1/8)	174 (6 7/8)	2,659 (104 3/4)	2,314 (91 1/8)
100	1,524 (60)	174 (6 7/8)	3,171 (124 7/8)	2,829 (111 1/2)
120	1,829 (72 1/4)	174 (6 7/8)	3,690 (145 3/8)	3,351 (132)
150	2,286 (90 1/4)	174 (6 7/8)	4,480 (176 1/2)	4,143 (163 1/4)
180	2,743 (108 1/4)	174 (6 7/8)	5,265 (207 3/8)	4,929 (194 1/8)
200	3,048 (120 3/8)	174 (6 7/8)	5,791 (228 3/8)	5,456 (214 7/8)
250	3,810 (150)	174 (6 7/8)	7,120 (280 3/8)	6,787 (267 1/4)
300	4,572 (180)	174 (6 7/8)	8,449 (332 3/4)	8,118 (319 3/4)

Necessary modifications of parts

- Spacer change (not necessary for the CRT spacers when using the 100- and 120-inch screens)
- Polarity change on the E board

When the angle of optical axis is 2°


Wall
Center of the screen
Vertical viewing area
(when the Sony VPS-700R is used)
b
a
O
B
−
+
A
18°
18°
Center hole
D
C
Floor

a = 2° (b = 15.4° ± 0.5°)

Screen size (inches)	Length mm (inches)			
	A	B	C	D
70	1,067 (42 1/4)	91 (3 5/8)	2,388 (94 1/8)	2,035 (80 3/16)
80	1,219 (48 1/8)	80 (3 1/4)	2,685 (105 3/4)	2,334 (92)
100	1,524 (60)	63 (2 1/2)	3,174 (125)	2,826 (111 3/8)
120	1,829 (72 1/4)	45 (1 13/16)	3,692 (145 3/8)	3,347 (131 7/8)
150	2,286 (90 1/4)	17 (11/16)	4,496 (177 1/8)	4,153 (163 5/8)
180	2,743 (108 1/4)	−10 (−13/32)	5,266 (207 3/8)	4,924 (194)
200	3,048 (120 3/8)	−28 (−1 1/8))	5,791 (228 3/8)	5,450 (214 5/8)
250	3,810 (150)	−75 (−3)	7,118 (280 3/8)	6,779 (267)
300	4,572 (180)	−120 (−4 3/4)	8,447 (332 5/8)	8,109 (319 3/8)

Necessary modifications of parts

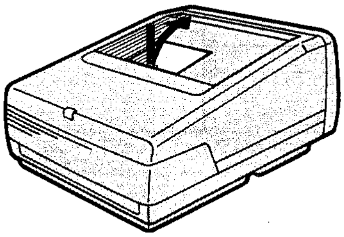
- Spacer change (not necessary for the CRT spacers when using the 100- and 120-inch screens)
- Polarity change on the E board

1-3. MODIFICATIONS OF PARTS

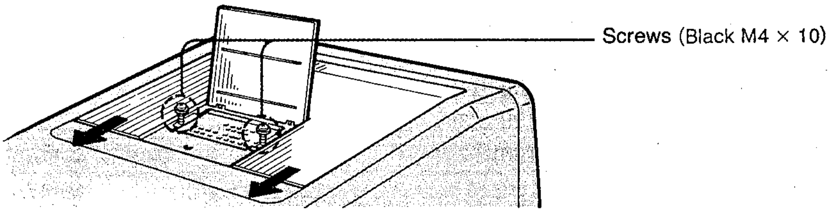
To modify certain parts in the projector, such as changing the spacers, open the hood after removing the top panel. You may keep the hood open by supporting it with the stay, or remove the hood while making modifications.
It is also necessary to remove the power block and HV block depending on the modifications.

Opening the Hood

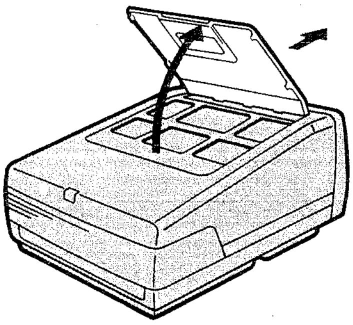
1 **Push the part marked "PUSH" on the control panel cover to open.** (Do not use force to open.)



2 **Loosen the two screws of the control panel and slide the top panel in the direction of the arrow.** (The screws do not come out of the hole to prevent their getting lost.)

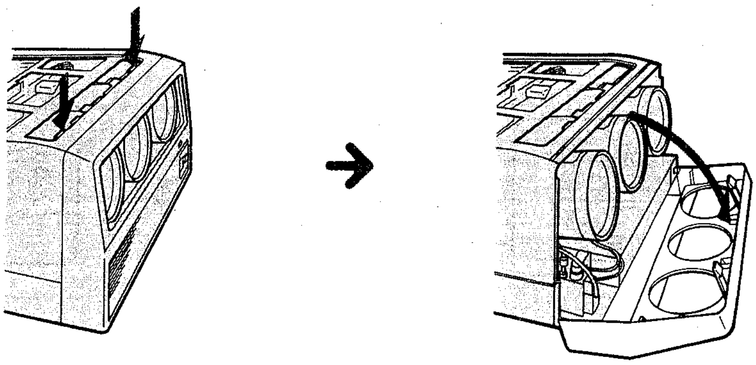


3 **Open the top panel toward the lens section, and remove it.**

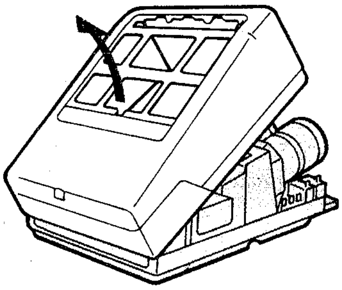


To be continued

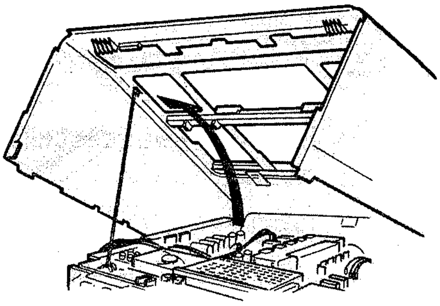
4 Press down the levers on both sides of the front panel to open toward you and remove the front panel.



5 Lift the front side of the hood upward.



6 Raise the stay to support the hood properly.



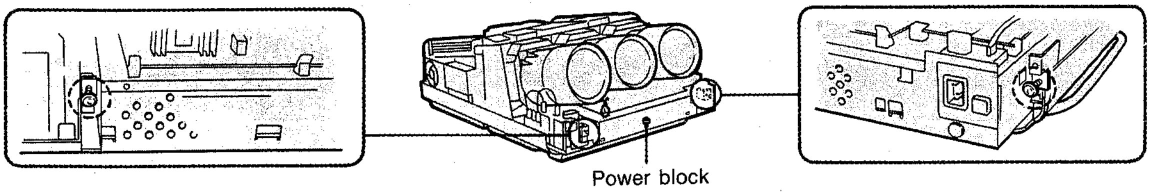
Note
You can remove the hood if necessary.

To replace the hood, front panel and top panel

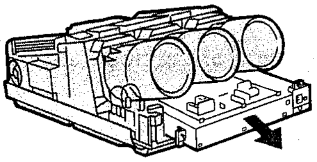
1. Retract the stay properly in the stay lock.
2. Position the hood so that the two screws can be inserted into their locations on the control panel. Tighten the screws.
3. Replace the front panel and press it until both levers click.
4. Replace the top panel.

Removing the Power Block and HV Block

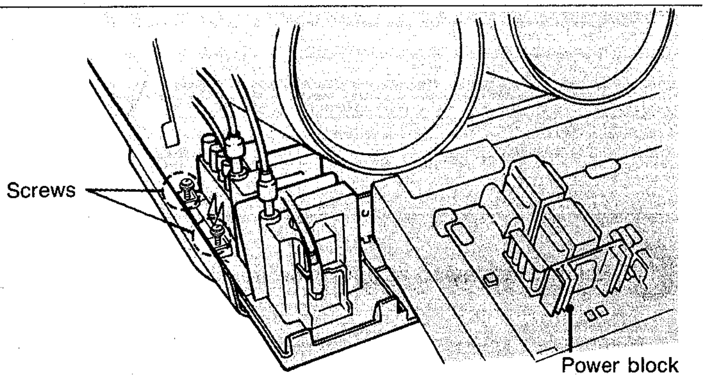
1 **Loosen the two screws at both sides of the power block.**
(The screws are retained in the hole, to prevent their getting lost.)



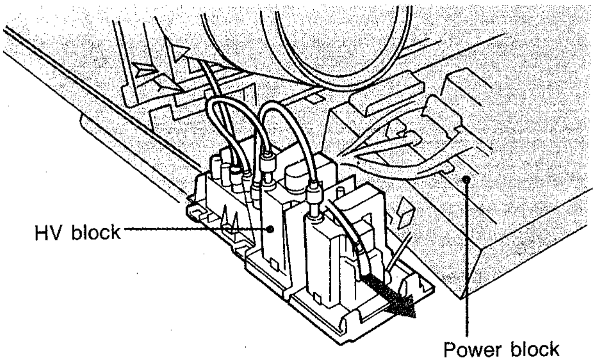
2 **Pull the power block out toward you.**



3 **Loosen the two screws of the HV block.** (The screws are retained in the hole, to prevent their getting lost.)



4 **Pull the HV block out toward you.**



To replace the power block and HV block

1 Replace the HV block and tighten the two screws, making sure that the lead wire is not sagging.
2 Reinstall the power block. Make sure that it is pushed inside fully and then fasten the screws.

Changing the CRT Spacers

The CRT spacers of the projector attached at the factory are for 86- to 139-inch front projection (or for 80- to 123-inch rear projection). For projection other than these screen sizes, the CRT spacers must be replaced.

The CRT spacers should be attached to the blue and red cathode-ray tubes only.

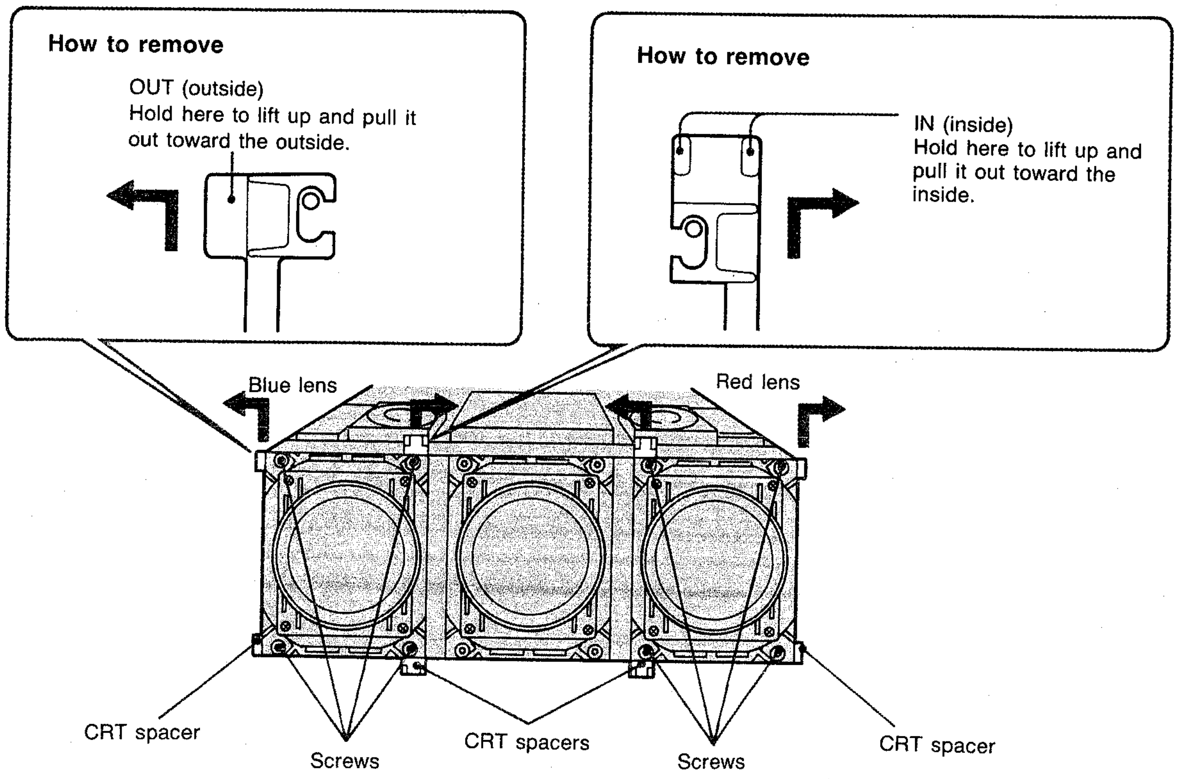
How to change the CRT spacers

Use a box screwdriver 400 mm long with a diagonal measurement of 8 mm.

1 **Remove the hood.**

2 **Remove the power block and HV block.**

3 **Loosen the four screws and remove the two CRT spacers that were attached at the factory for red and blue cathode-ray tubes.**


How to remove
OUT (outside)
Hold here to lift up and pull it out toward the outside.
How to remove
IN (inside)
Hold here to lift up and pull it out toward the inside.
Blue lens
Red lens
CRT spacer
Screws
CRT spacers
Screws
CRT spacer

4 **Confirm the necessary spacer size using the following table and attach the supplied CRT spacers to both the outside and inside of the red and blue cathode-ray tubes.**

Attach the spacers with the "OUT" mark to the outside and the ones with the "IN" mark to the inside of the CRTs.

Front projection

Screen size (inches)	70 — 85	86 — 139	140 — 300
Size mark	S	M	L

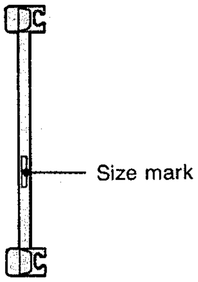
Rear projection

Screen size (inches)	70 — 79	80 — 123	124 — 300
Size mark	S	M	L

Note

When the washers are to be inserted, see the table for front projection even in the case of rear projection.

CRT spacer



5 **Fasten all screws as before.**

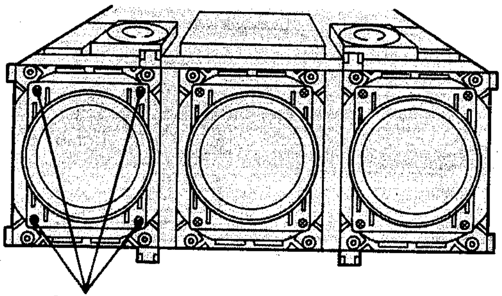
Changing the Lens Spacers for Front Projection

The lens spacers attached at the factory are for 86- to 139-inch front projection. For projection other than these screen sizes, change the lens spacers.

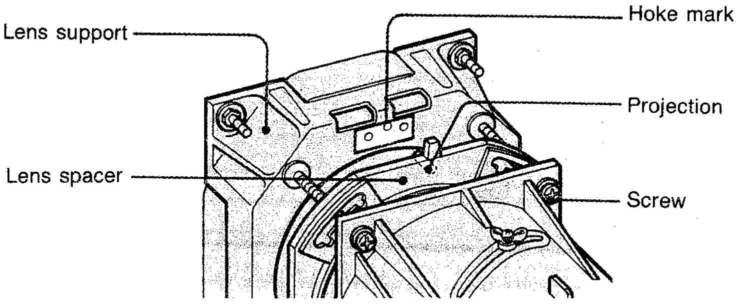
1 **Remove the hood.**

2 **Remove the power block and HV block.**

3 **Loosen the four screws each of the red, green, and blue lenses.**
Make sure that the projections under the two upper screws are separated from the lens spacer.

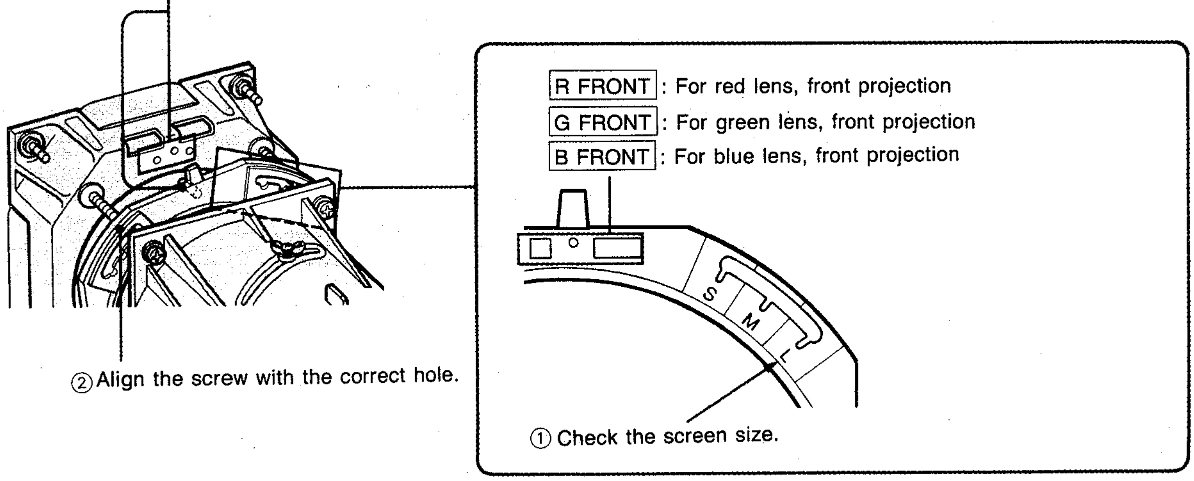


4 **Separate the projection on the rear of the lens spacer from the hole mark on the lens support.**


Lens support
Hoke mark
Projection
Lens spacer
Screw

5 **Confirm which hole is to be used, using the following table.
Align the screw with that hole to fix the lens spacer to the lens support.**

Lens	Screen size (inches) / Lens spacer	70 — 85	86 — 139	140 — 300
Red	R FRONT	S	M (preset at the factory)	L
Green	G FRONT			
Blue	B FRONT			



③ Align the projection on the rear of the lens spacer with the hole mark on the lens support.

② Align the screw with the correct hole.

R FRONT : For red lens, front projection
G FRONT : For green lens, front projection
B FRONT : For blue lens, front projection

① Check the screen size.

6 **Make sure that each lens spacer is firmly attached to the lens support and fasten the four screws for each lens.**

7 **Reinstall the power block and HV block.**

8 **Reinstall the hood, front panel and top panel.**

Note
If it is difficult to change the lens spacer while the lens is attached, remove the lens.

Changing the Lens Spacers for Rear Projection

Screen sizes and the necessary spacers

Determine the necessary spacers and confirm the size to be used.

Angle of optical axis	**Lens**	**Screen size*** / **Lens spacer**	**70 — 79**	**80 — 123**	**124 — 300**
0°	Red	R-0 REAR	S	M	L
	Green	G-0 REAR	Usable for all sizes		
	Blue	B-0 REAR	S	M	L
2°	Red	R-2 REAR	S	M	L
	Green	G-2 REAR			
	Blue	B-2 REAR			

* Note that the screen size ranges differ from those of lens spacers for front projection.

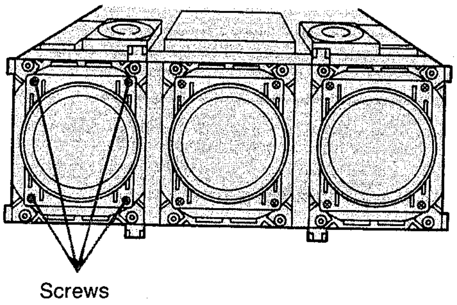
Note
When the washers are to be inserted, see the table for front projection, even in the case of rear projection.

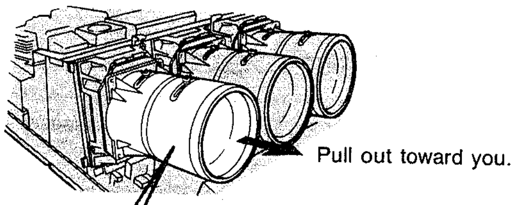
How to change the lens spacers

1 **Remove the hood.**

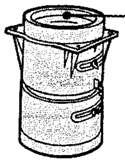
2 **Remove the power block and HV block.**

3 **Remove the lenses from the lens supports.**
Remove the four screws of each lens and pull the lens out toward you.



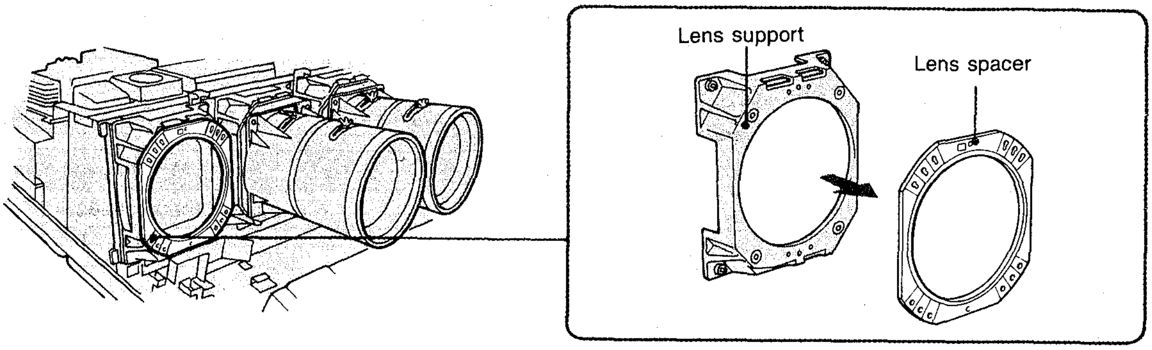


How to keep the separated lenses



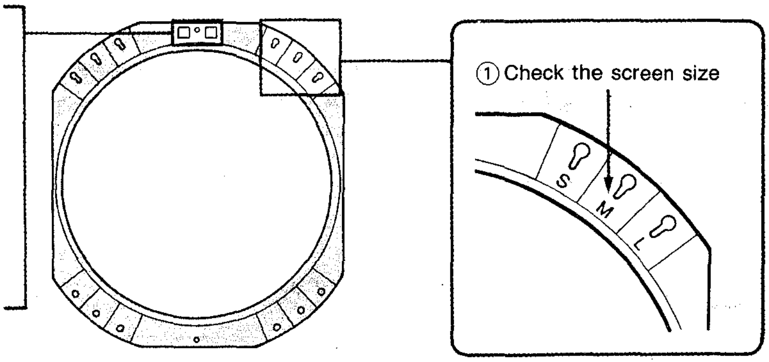
Be sure to keep the lenses with the CRT side up. Treat the lenses carefully.

4 Remove each lens spacer.

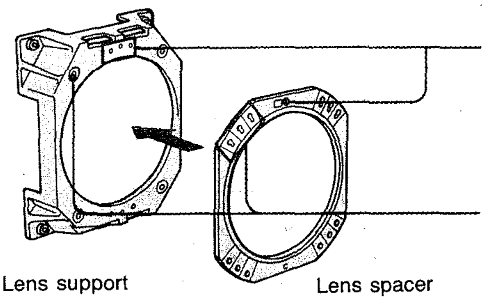


5 See the table on page 22 to select the correct lens spacer from the supplied ones. Then, confirm the hole to be used and fix the lens spacer with the lens support, aligning that hole.

R-0 · REAR : For red, angle of optical axis "0°"
B-0 · REAR : For blue, angle of optical axis "0°"
R-2 · REAR : For red, angle of optical axis "2°"
B-2 · REAR : For blue, angle of optical axis "2°"
G-2 · REAR : For green, angle of optical axis "2°"



① Check the screen size



③ Align the projection on the rear of the lens spacer with the hole mark on the lens support.

② Align the hole to be used with the screw hole on the lens support.

6 Reinstall the lenses. Make sure that each lens spacer is firmly attached to the lens support, then fasten the four screws for each lens.

7 Reinstall the power block and HV block.

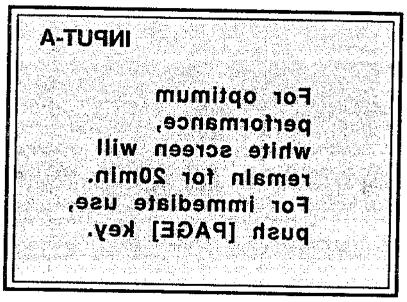
8 Reinstall the hood, front panel and top panel.

Changing the Polarity

This projector is preset at the factory for use in front projection when the projector is installed on the floor/desk. When the projector is installed on the ceiling or used in rear projection, the display will be shown as follows when the power is turned on. Change the polarity to reverse the display.

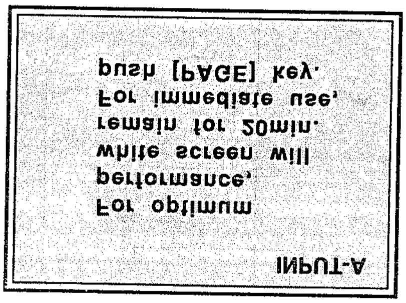
A

The letters are backward.
Change the connectors on the E board.


INPUT-A
For optimum
performance,
white screen will
remain for 20min.
For immediate use,
push [PAGE] key.

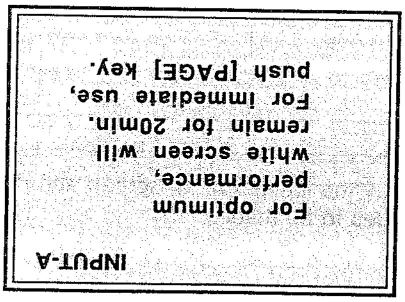
B

The letters are upside down.
Change the connectors on the DC board.


push [PAGE] key.
For immediate use,
remain for 20min.
white screen will
performance,
For optimum
INPUT-A

C

The letters are upside down and backward.
Change the connectors on the DC and E boards.


push [PAGE] key.
For immediate use,
remain for 20min.
white screen will
performance,
For optimum
INPUT-A

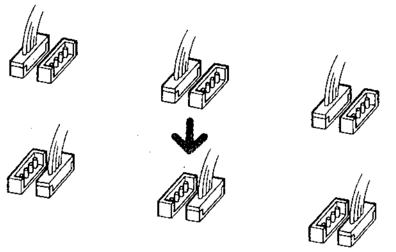
How to change the polarity

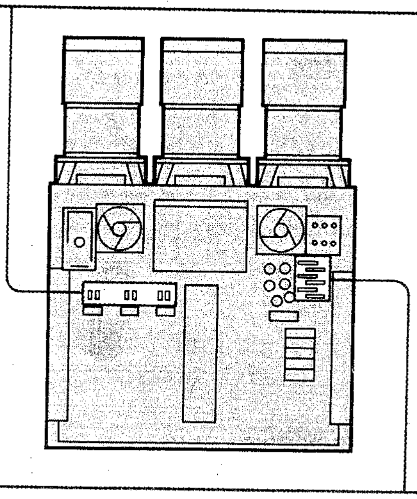
1 **Turn off the power.**

2 **Open the hood.**

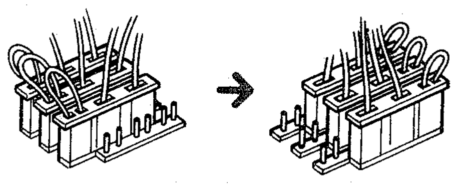
3 **Change the connectors.**

DC board: Shift the connectors to the immediately parallel receptacle.





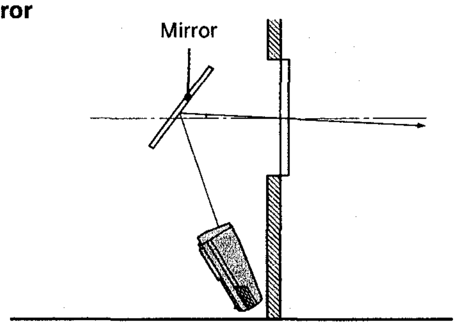
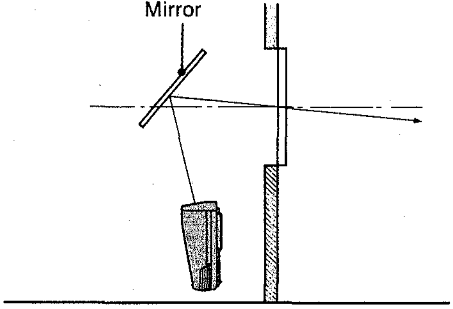
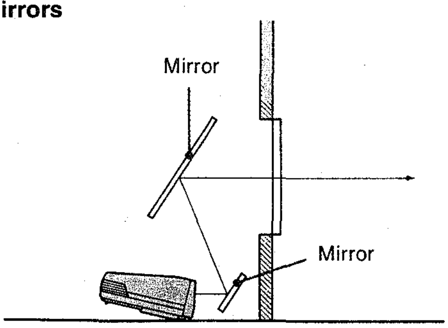
E board: Reinsert the connectors after turning them over (180°).



4 **Make sure to insert the connectors firmly.**

Necessary polarity changes according to the installation methods

Y: Necessary
N: Not necessary

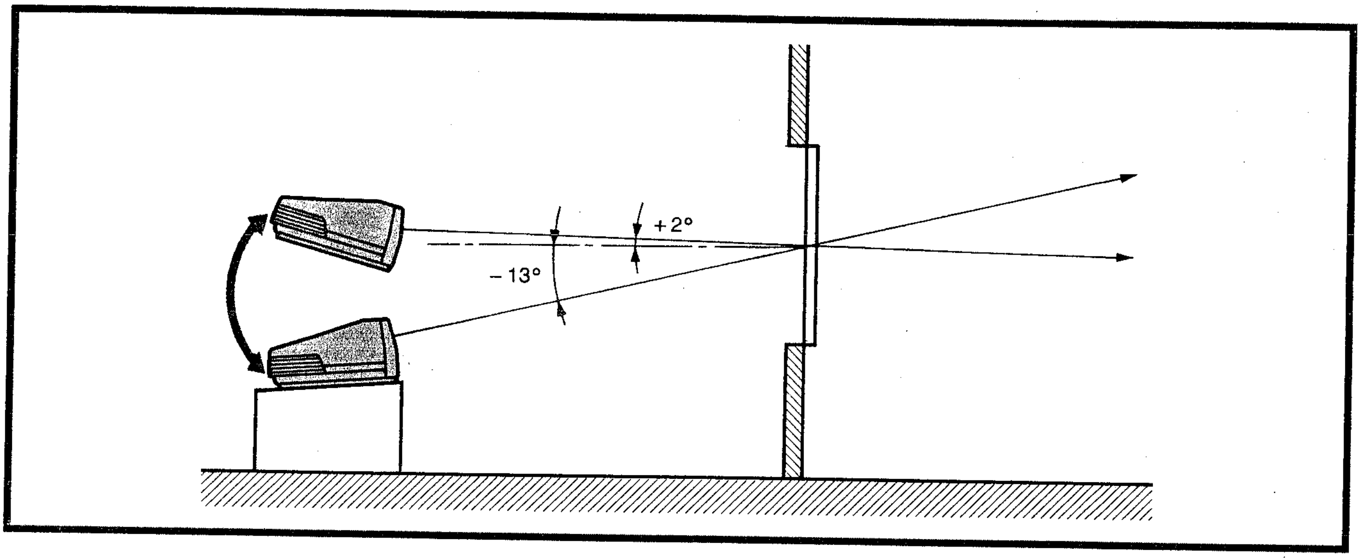
Installation methods	Change on DC board	Change on E board	On-screen Display
Front projection, ceiling	Y	Y	C
Rear projection, floor	N	Y	A
Rear projection, ceiling	Y	N	B
Rear projection using mirrors **Using a mirror** 	N	N	Correct picture
Using a mirror 	Y	Y	C
Using two mirrors 	N	Y	A
Others	Display the letters on the screen and determine which changes to be made.		

1-4. WHEN INSTALLATION DOES NOT COMPLY WITH STANDARD MEASUREMENTS

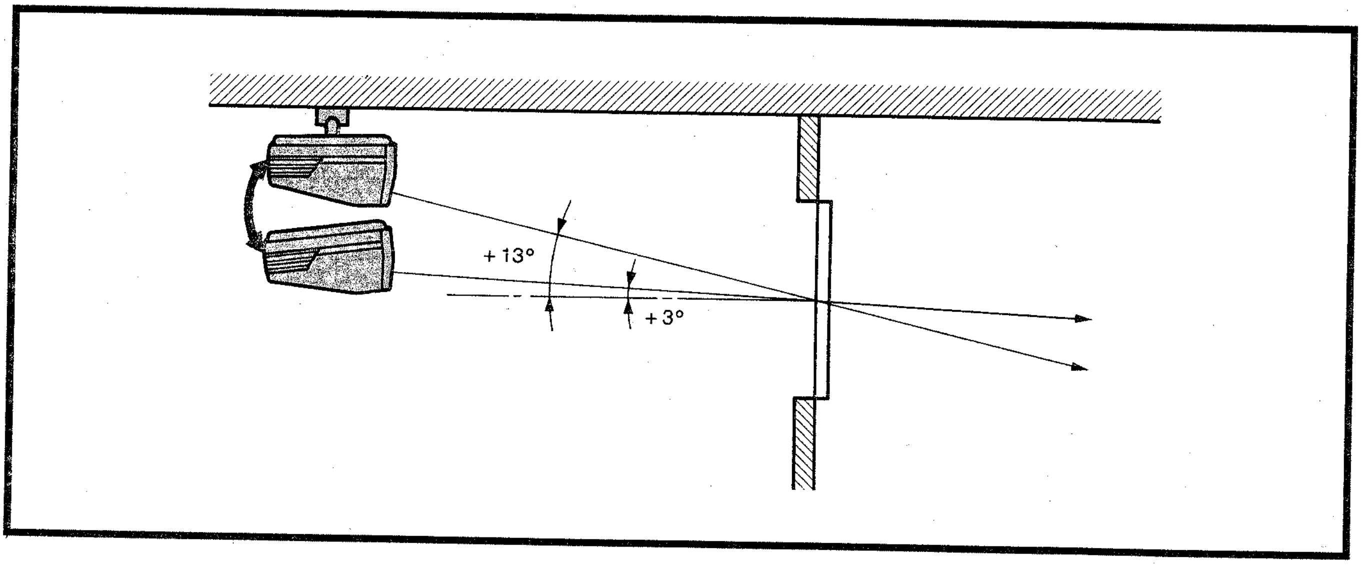
If the projector cannot be installed using a standard installation method mentioned on pages 13 to 19, you cannot obtain the picture in focus no matter how you adjust the lens focus. In that case, insert the supplied washers between the lens and cathode-ray tube so that the lens can be focused.

Variable Range of the Angle of Optical Axis in Rear Projection

This projector can be installed on the floor within an angle of optical axis 2° to −13° as shown in the illustration.



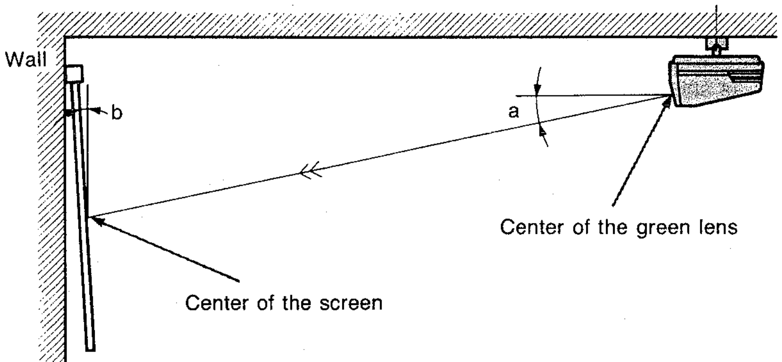
When the projector is installed on the ceiling, the angle of optical axis must be within +3° to +13°.



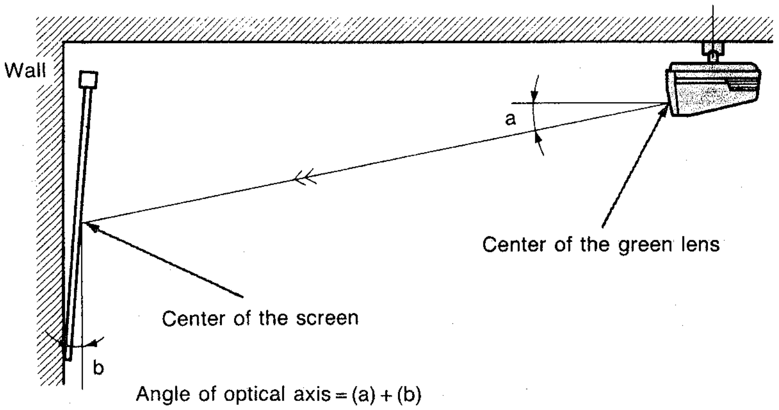
If the angle is 0° or 2°, you need not insert the washers.

Selecting the Washer

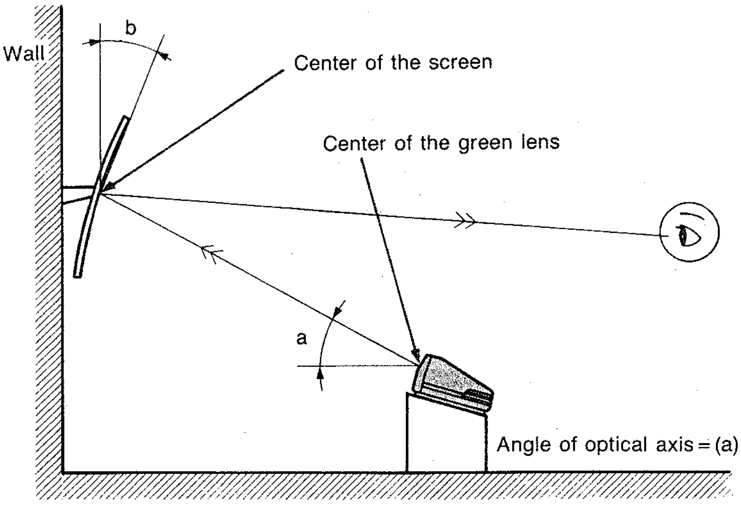
1 **Use the installation plan to find the angle (a) on the straight line from the center of the screen to the center of the projector's green lens.**
When there is an angle (b) on a screen (which is not perpendicular) as shown in the illustrations, subtract this angle (b) from the angle (a) to find the angle of optical axis against the screen.


Wall
b
a
Center of the green lens
Center of the screen

Angle of optical axis = (a) – (b)


Wall
a
Center of the green lens
Center of the screen
b

Angle of optical axis = (a) + (b)


b
Wall
Center of the screen
Center of the green lens
a

Angle of optical axis = (a) – (b)

To be continued

2 **Use the "List of washers used for non-standard installation" to determine the washers (A) required in accordance with the corresponding angle and the screen size.**

Example: When the angle is 8° with a 120-inch screen

The data given in the list is as follows.

A	0.4 + 0.4
B	65

(A: Washer thickness
B: See page 113.)

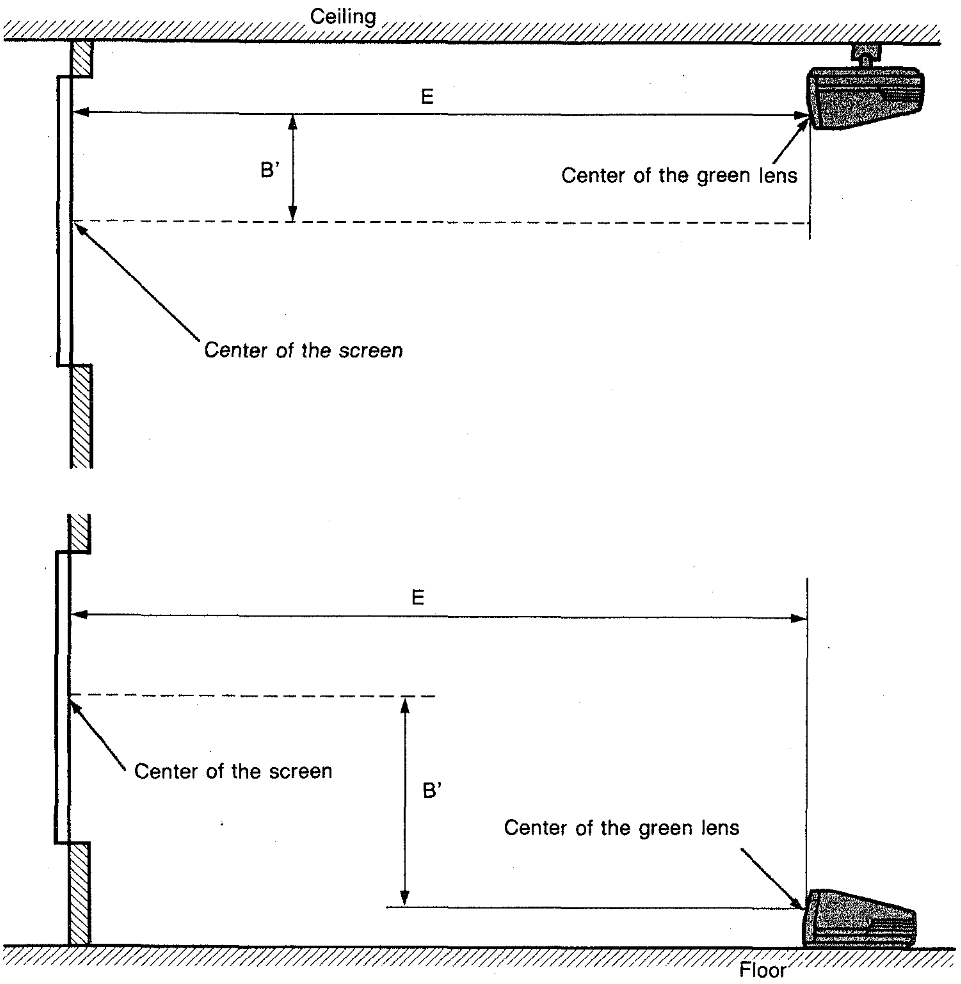
In this case, install two 0.4-mm thick washers (supplied).

Notes

- Use the same washer for this angle in any installation method, including floor and ceiling installations. For example, use the same washer for 10° in both a floor installation with the angle of −10° and a ceiling installation with the angle of +10°.
- When you use a curved screen (or a screen with a large screen gain), determine the angle of the screen as first priority so that you can get the brightest picture. (Refer to the illustration with the curved screen in step 1 above.)
- If the angle of optical axis is changed, the projection distance also changes.

If you cannot get the optical axis using the installation plan, determine the washers to be used by the following procedure.

1 **Measure the distance (E) from the screen to the center of the green lens.**


Ceiling
E
B'
Center of the green lens
Center of the screen
E
Center of the screen
B'
Center of the green lens
Floor

2 **Measure the difference in height (B') between the center of the screen and the center of the green lens.**

3 **Divide B' by E.**

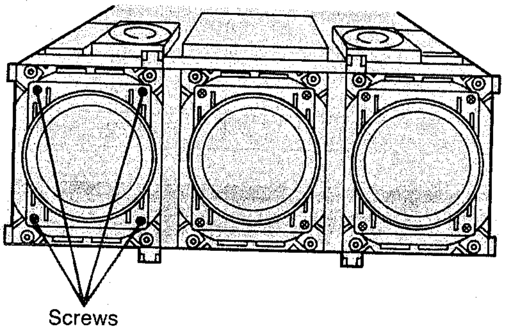
4 **Use the "List of washers used for non-standard installation" and determine the washers required in accordance with the corresponding value given by step 3 and the screen size.**

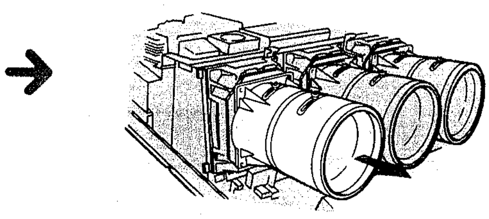
How to insert the washers

1 **Open the hood.** (See page 20, 21)

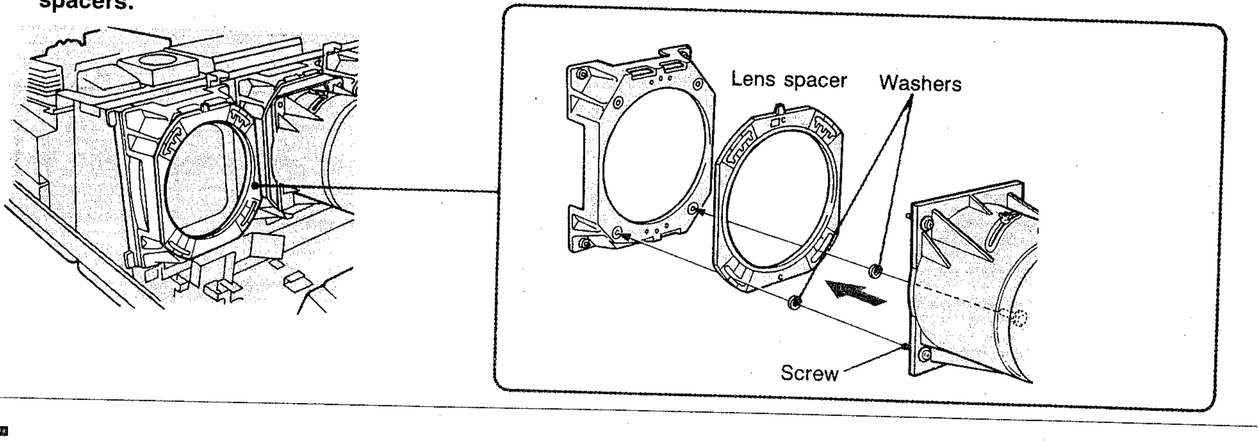
2 **Remove the power block and HV block.** (See page 22)

3 **Remove the lenses from the lens supports.**
Remove the four screws of each lens and pull the lens out toward you.





4 **Mount the washers on the two screws attached at the bottom of the lens and reinstall the lenses, aligning them with the appropriate hole on the lens spacers.**



5 **Fasten the four screws for each lens.**

6 **Reinstall the power block and HV block.**

7 **Reinstall the hood and top panel.**

Notes

- Even if you install the projector using the rear projection, use the CRT spacers and lens spacers for front projection.
- Not to drop the washer inside the projector. If you do so, be sure to pick it up.

1-5. NOTES ON SCREEN

Screen Size

The screen size defines the size of a screen using the diagonal length in inches while the aspect ratio of the screen is 4:3. The ratio of the screen height, width, and diagonal is 3:4:5. You can calculate the screen height and width from the screen size (inches) as follows.

Height = Screen size x 25.4 x 3 / 5
Width = Screen size x 25.4 x 4 / 5

Screen size and dimensions

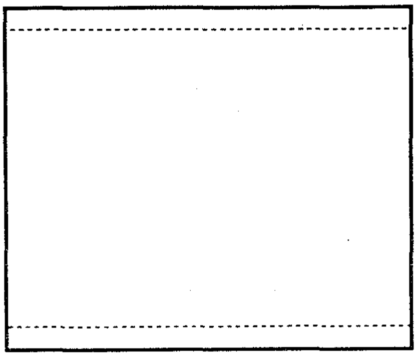
Screen size (inches) (Diagonal)	Height (mm)	Width (mm)
70	1067	1422
72	1097	1463
80	1219	1626
100	1524	2032
120	1829	2438
150	2286	3048
180	2743	3058
200	3048	4064
250	3810	5080
300	4572	6096

Screens Whose Aspect Ratio Is Not 3:4

When the height is greater

Calculate the approximate screen size from the screen height as shown below. Install the projector and screen in accordance with the screen size obtained.

– – – : Screen whose aspect ratio is 3:4

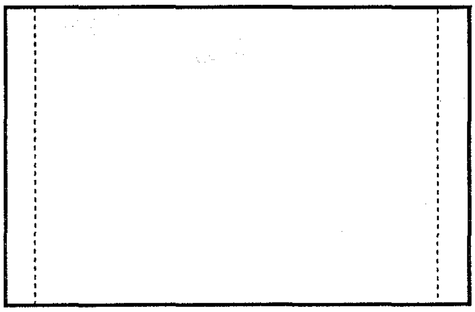


Screen size = Height (mm) x 5 / 3 ÷ 25.4
Example: When the screen height is 1500 mm
1500 x 5 / 3 ÷ 25.4 = 98 inches

When the width is greater

Calculate the approximate screen size from the screen width as shown below. Install the projector and screen in accordance with the screen size obtained.

– – – : Screen whose aspect ratio is 3:4

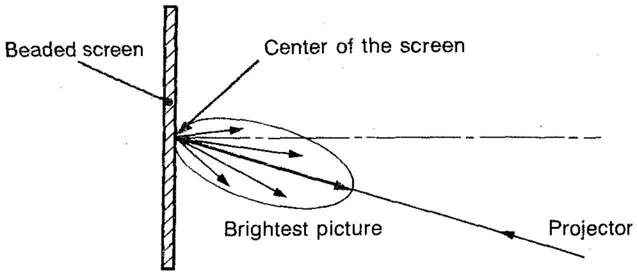


Screen size = Width (mm) x 5 / 4 ÷ 25.4
Example: When the screen width is 2000 mm
2000 x 5 / 4 ÷ 25.4 = 98 inches

Types of Screen

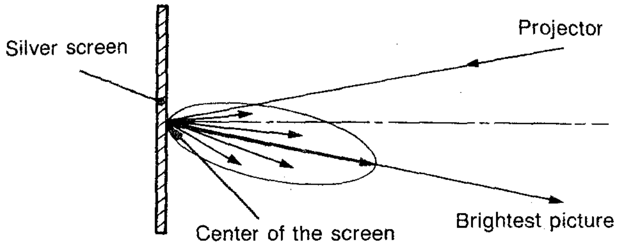
Front projection screen for floor installation

The beaded screen is recommended. A screen of this type reflects the brightest light to the incidence position. The Sony VPS-100F1 and VPS-120F screens are beaded screens.


Beaded screen
Center of the screen
Brightest picture
Projector

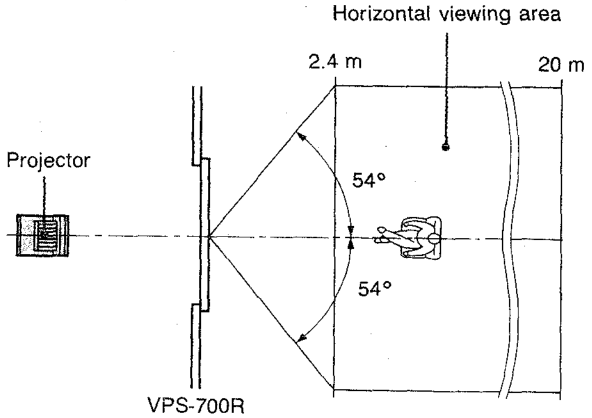
Front projection screen for ceiling installation

The silver screen is recommended. You can get a picture that is two to four times brighter.


Projector
Silver screen
Center of the screen
Brightest picture

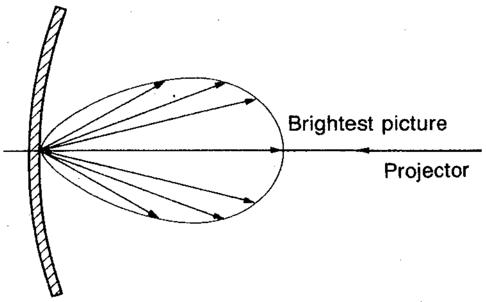
Rear projection screen

A screen manufactured using two sheets, the fresnel and lenticular, is recommended for a bright and clear full-screen picture projection. The Sony VPS-700R rear screen is this type with black stripes that can produce high quality contrast by blocking out outside light.
The illustration shows the horizontal viewing area for a screen of this type.

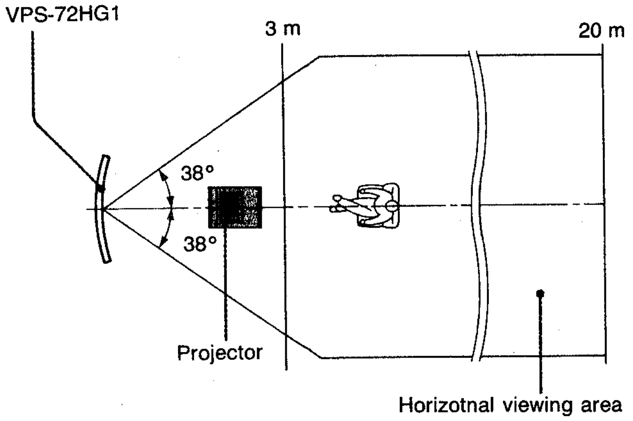

Horizontal viewing area
2.4 m
20 m
Projector
54°
54°
VPS-700R

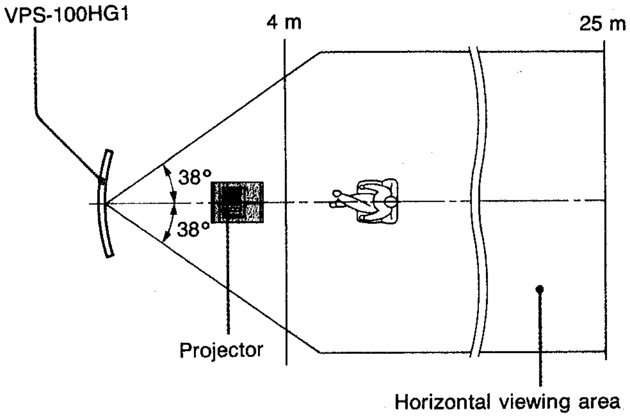
Aluminum (Curved) screen

When you install the projector in a narrow room, you can get a brighter picture using the aluminum screen for both floor and ceiling installations. An aluminum screen has a narrow directivity, resulting in a limited viewing area. However, it allows you to get a very bright picture in a narrow room. Note that a screen of this type can easily be affected by outside light and therefore requires consideration for a proper lighting system arrangement in the room. The Sony VPS-72HG1 and VPS-100HG1 screens are aluminum screens.


Brightest picture
Projector

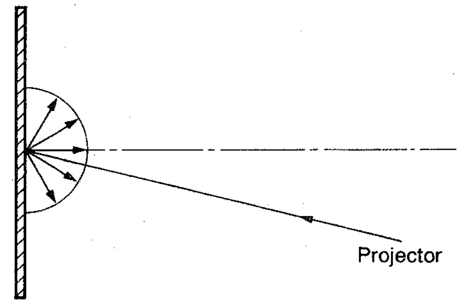
The illustrations below show the horizontal viewing area for a screen of this type.


VPS-72HG1
3 m
20 m
38°
38°
Projector
Horizotnal viewing area


VPS-100HG1
4 m
25 m
38°
38°
Projector
Horizontal viewing area

White screen

When a number of viewers watch picture projection in a wide area, a picture that appears equally bright from all parts of the room can be obtained using the white screen for both floor and ceiling installations. Note that you will not be able to get a clear picture in this case unless the room is dark.

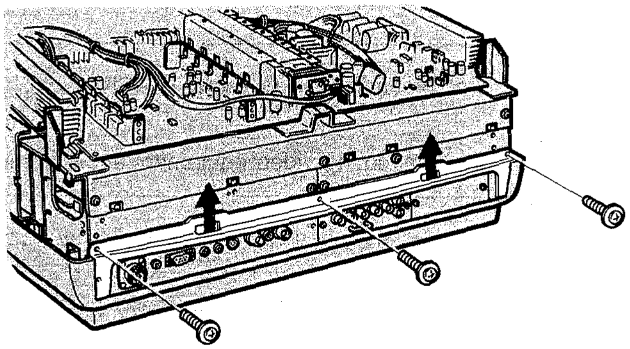


1-6. DYNAMIC PICTURE SETTING

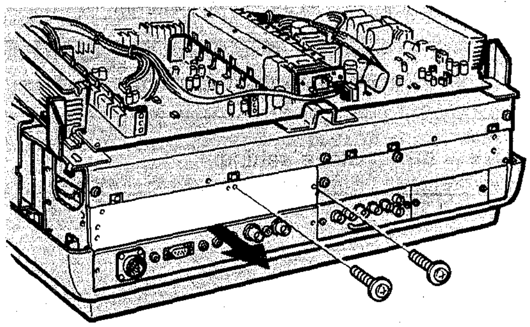
When the video signal is input, you can obtain the picture of high quality contrast by switching the DYNAMIC PIC SW on the BA board. (The switch is set to OFF at the factory.)

1 **Open the hood.**

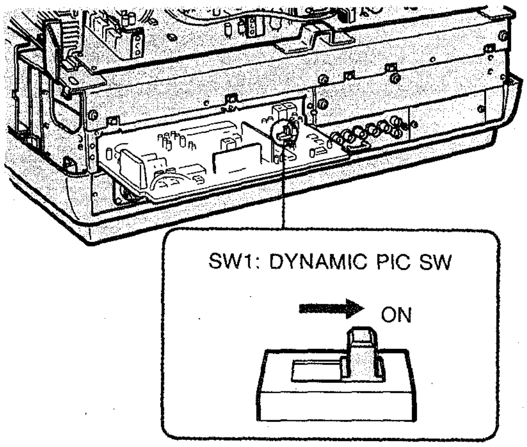
2 **Remove the three screws on the upper part of the connector panel frame to remove.**



3 **Remove the two screws on the upper cover of the connector panel and remove the cover.**



4 **Pull the BA board out toward you and set the SW1: DYNAMIC PIC SW on the board to ON.**



5 **Replace the parts following steps 4 to 1 in reverse.**

Connections

Contents

Connecting to the projector directly

Connecting video equipment and a computer equipped with the RGB output

Connecting when the projector is away from other equipment

Using the IFU-1271M interface unit

Using the PC-1271M switcher

Connecting more than four input sources

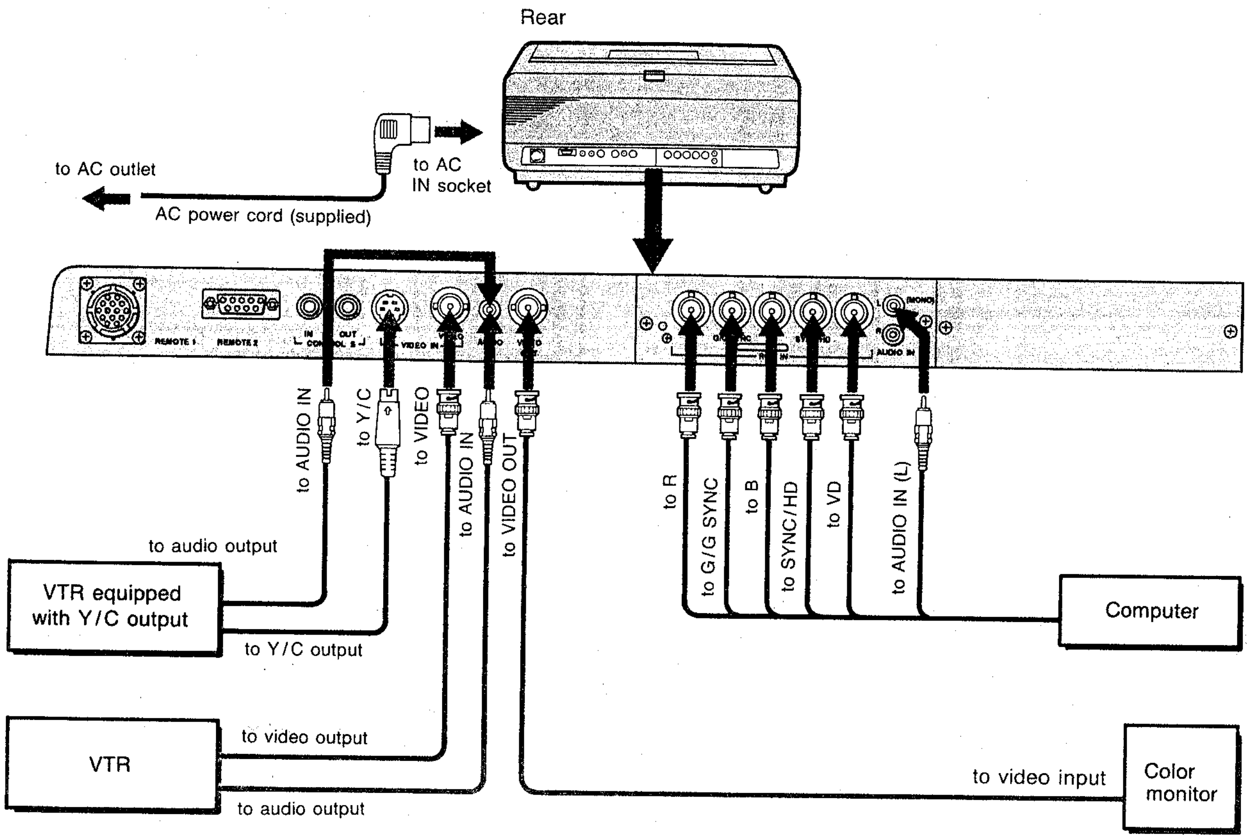
5BNC mode setting

1-7. CONNECTING TO THE PROJECTOR DIRECTLY

You can expand the system connections by installing the optional interface board to INPUT A or B, or in combination with the examples mentioned below.

Connecting Video Equipment and a Computer Equipped with the RGB Output

When a color monitor is not connected to the computer

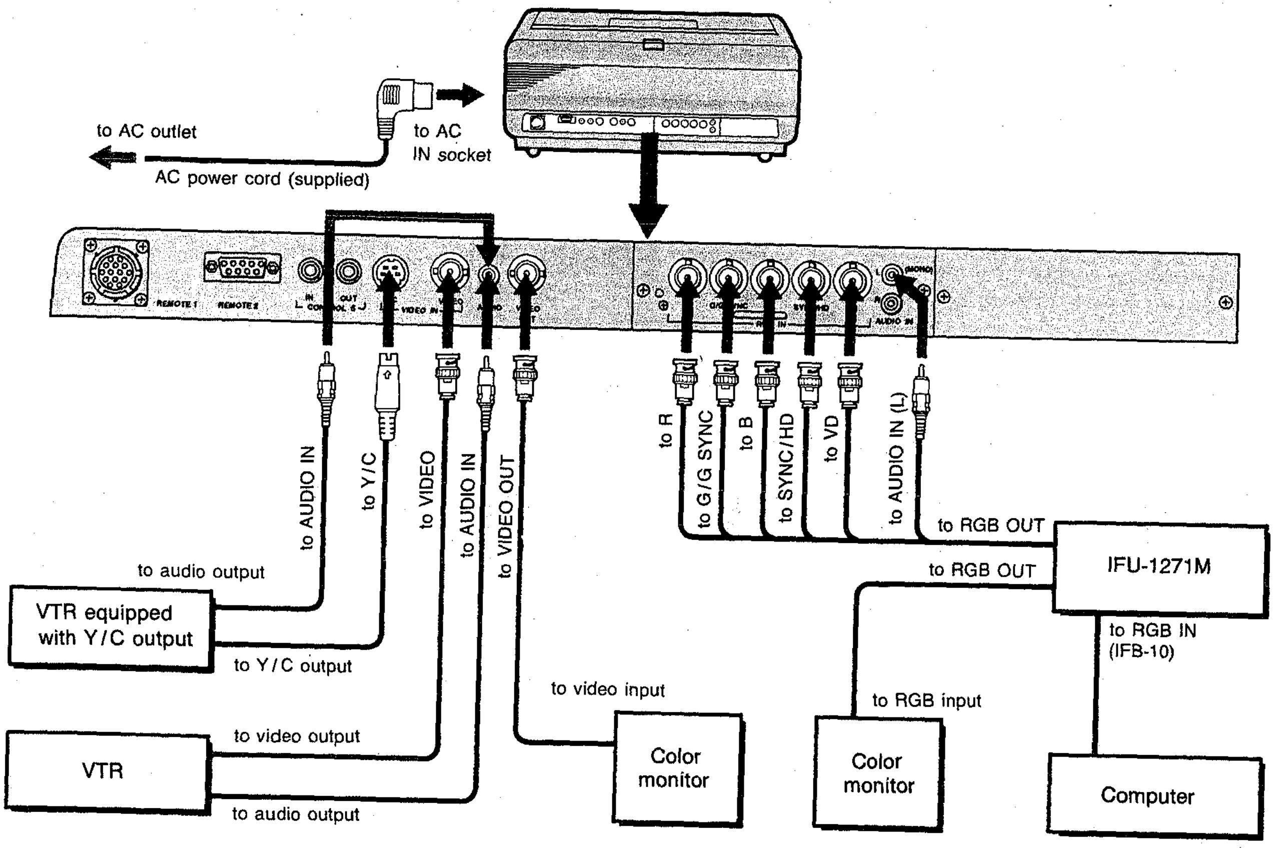

Rear
to AC outlet
to AC IN socket
AC power cord (supplied)
REMOTE 1
REMOTE 2
IN
OUT
CONTROL S
VIDEO IN
AUDIO IN
(MONO)
L
R
to AUDIO IN
to Y/C
to VIDEO
to AUDIO IN
to VIDEO OUT
to R
to G/G SYNC
to B
to SYNC/HD
to VD
to AUDIO IN (L)
to audio output
VTR equipped with Y/C output
to Y/C output
Computer
VTR
to video output
to audio output
to video input
Color monitor

Notes

- The VIDEO connector is disconnected automatically when a cable is connected to the Y/C connector.
- The external sync signal has priority over the internal sync signal. However, when the external sync signal is incomplete, the internal sync signal has priority.

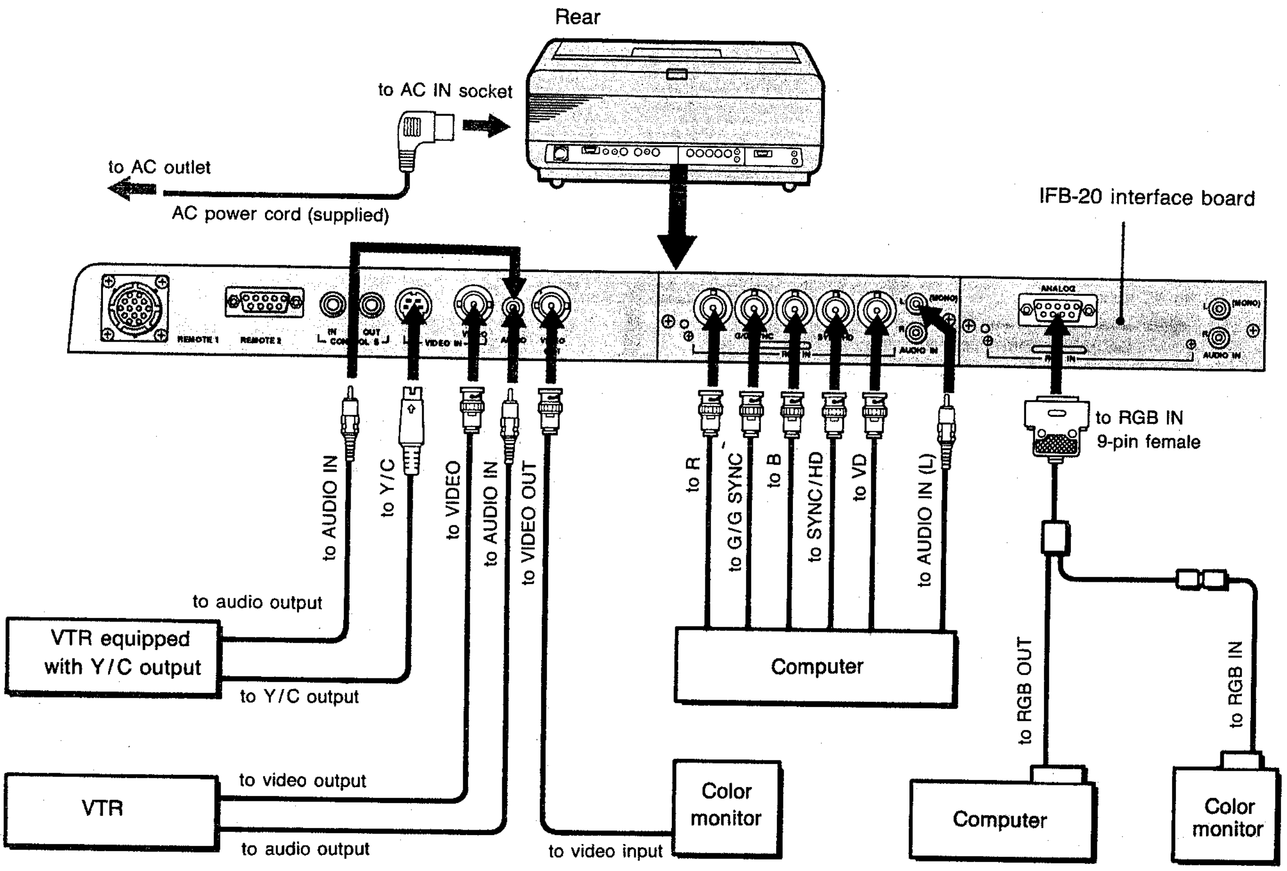
When a color monitor is connected to the computer

Use the IFU-1271M interface unit.


to AC outlet
AC power cord (supplied)
to AC
IN socket
to AUDIO IN
to Y/C
to VIDEO
to AUDIO IN
to VIDEO OUT
to R
to G/G SYNC
to B
to SYNC/HD
to VD
to AUDIO IN (L)
to RGB OUT
to RGB OUT
IFU-1271M
to RGB IN
(IFB-10)
to audio output
VTR equipped
with Y/C output
to Y/C output
VTR
to video output
to audio output
to video input
Color
monitor
to RGB input
Color
monitor
Computer

When a computer is connected to the projector using the SIC-series connecting cable

Install the optional interface board to the INPUT A or INPUT B section.


Rear
to AC IN socket
to AC outlet
AC power cord (supplied)
IFB-20 interface board
REMOTE 1
REMOTE 2
ANALOG
AUDIO IN
to RGB IN
9-pin female
to AUDIO IN
to Y/C
to VIDEO
to AUDIO IN
to VIDEO OUT
to R
to G/G SYNC
to B
to SYNC/HD
to VD
to AUDIO IN (L)
to audio output
VTR equipped with Y/C output
to Y/C output
Computer
to RGB OUT
to RGB IN
VTR
to video output
to audio output
Color monitor
to video input
Computer
Color monitor

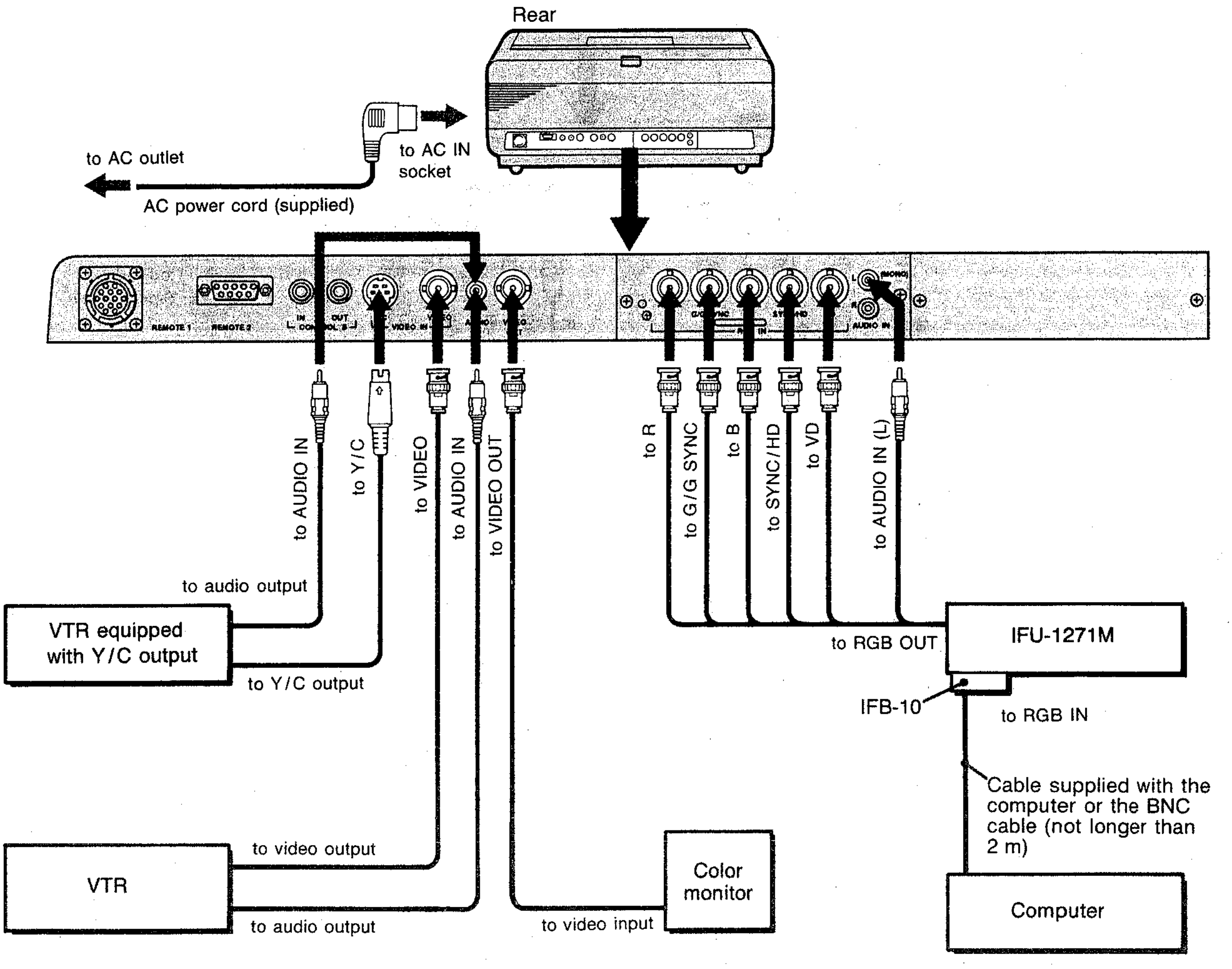
Note
Use the standard SIC cable. Be sure not to extend the length of the cable. Otherwise, the picture may be distorted.

1-8. CONNECTING WHEN THE PROJECTOR IS AWAY FROM OTHER EQUIPMENT

Use the IFU-1271M interface unit or the PC-1271M switcher (not supplied).

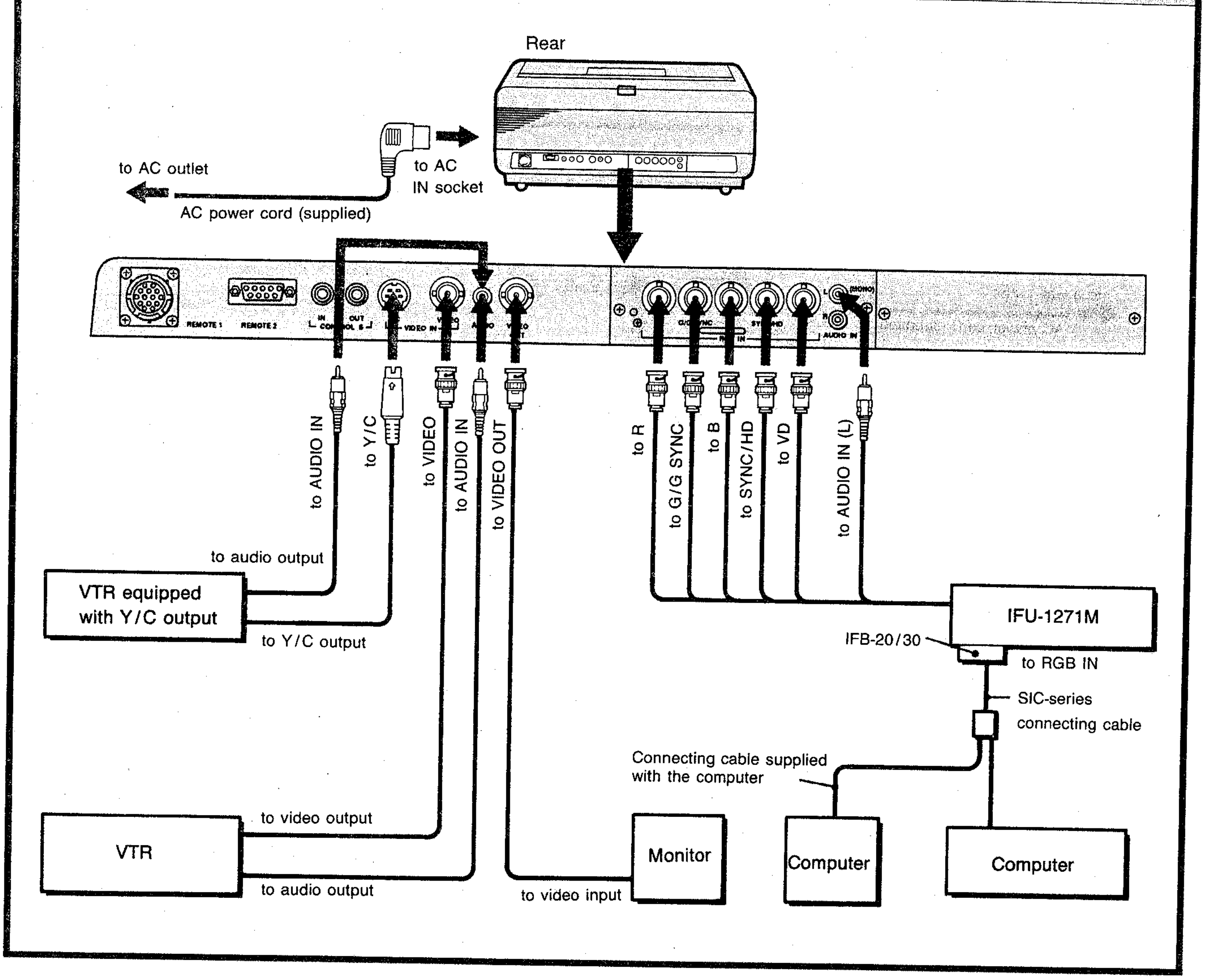
Using the IFU-1271M Interface Unit

Connecting a computer using the BNC cable


Rear
to AC outlet
to AC IN socket
AC power cord (supplied)
to AUDIO IN
to Y/C
to VIDEO
to AUDIO IN
to VIDEO OUT
to R
to G/G SYNC
to B
to SYNC/HD
to VD
to AUDIO IN (L)
to audio output
VTR equipped with Y/C output
to Y/C output
to RGB OUT
IFU-1271M
IFB-10
to RGB IN
Cable supplied with the computer or the BNC cable (not longer than 2 m)
VTR
to video output
to audio output
Color monitor
to video input
Computer

- If a color monitor is used, connect the RGB input on the monitor to the RGB OUT connectors on the IFU-1271M interface unit.

Connecting the computer using the SIC-series connecting cable


Rear
to AC outlet
to AC
IN socket
AC power cord (supplied)
to AUDIO IN
to Y/C
to VIDEO
to AUDIO IN
to VIDEO OUT
to R
to G/G SYNC
to B
to SYNC/HD
to VD
to AUDIO IN (L)
to audio output
VTR equipped
with Y/C output
to Y/C output
IFU-1271M
IFB-20/30
to RGB IN
SIC-series
connecting cable
Connecting cable supplied
with the computer
to video output
VTR
to audio output
to video input
Monitor
Computer
Computer

Use the appropriate cable for connection between the projector and the IFU-1271M referring to the following table.

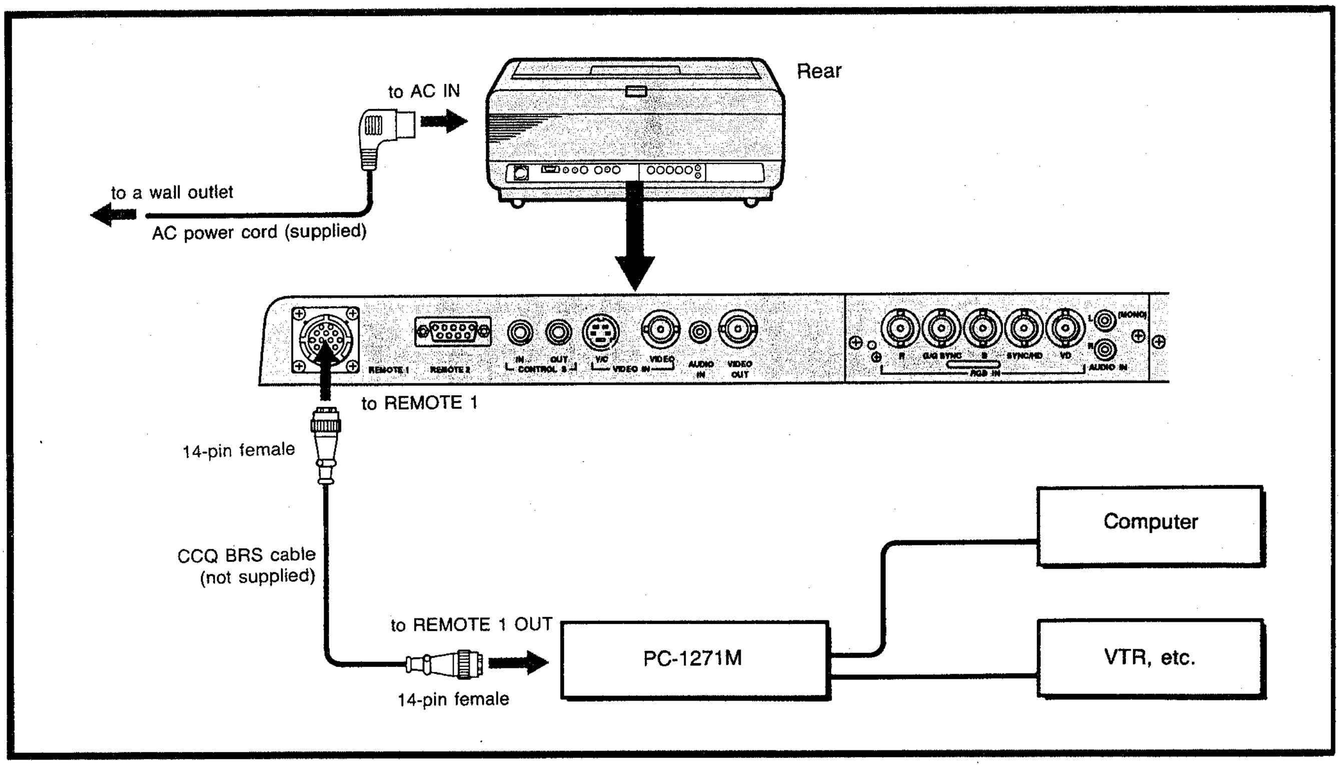
Cable length	Up to 10 m	Up to 25 m	Up to 50 m
Cable thickness	1.5C-2V (SIC-10)	3C-2V	5C-2V

Using the PC-1271M Switcher

Connect the projector to the PC-1271M switcher using the CCQ BRS connecting cable.

1-9. CONNECTING MORE THAN FOUR INPUT SOURCES

When you use the PC-1271M switcher (not supplied), you can connect easily more than four input sources.
You can select up to 16 inputs by pressing the SWITCHER/INDEX keys on the Remote Commander or the SWITCHER keys on the control panel of the projector.


Rear
to AC IN
to a wall outlet
AC power cord (supplied)
REMOTE 1
REMOTE 2
IN
OUT
CONTROL S
Y/C
VIDEO IN
AUDIO IN
VIDEO OUT
R
G/G SYNC
B
SYNC/HD
VD
RGB IN
L
(MONO)
R
AUDIO IN
to REMOTE 1
14-pin female
CCQ BRS cable (not supplied)
to REMOTE 1 OUT
14-pin female
PC-1271M
Computer
VTR, etc.

Use the appropriate cable among the following table.

1 m	2 m	5 m	10 m	15 m	25 m	50 m
	CCQ-2BRS	CCQ-5BRS	CCQ-10BRS		CCQ-25BRS	CCQ-50BRS
SIC-M-1		SIC-M-5		SIC-M-15	SIC-M-25	SIC-M-50

Notes
- Insert the female and male plugs of the CCQ-BRS cable correctly.
- The CCQ-BRS cable can be extended to maximum 50 m.
- The equipment can be connected to the VIDEO IN and the RGB IN connectors even when the switcher is connected.

Using the SWITCHER/INDEX (SWITCHER) keys
When you use the Remote Commander, set the SWITCHER/INDEX select switch to SWITCHER.
Press the number key from 1 to 8 to select the input number of the switcher. The SECOND key is used when two switchers are connected. To control the second switcher (whose SINGLE/REMOTE2/SECOND switch is set to SECOND), first press SECOND and then the number key.

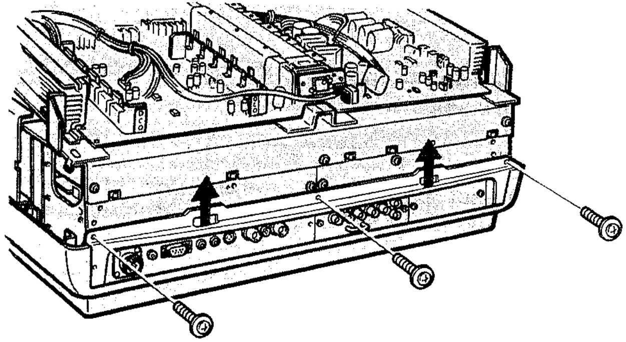
5BNC Mode Setting

When a high-resolution computer, such as a workstation with a horizontal scanning frequency of more than 50 kHz, is connected to the projector through the PC-1271M switcher from 25 — 50 m away, change the 5BNC mode and connect to the REMOTE 1 connector and the RGB IN connectors on the projector.

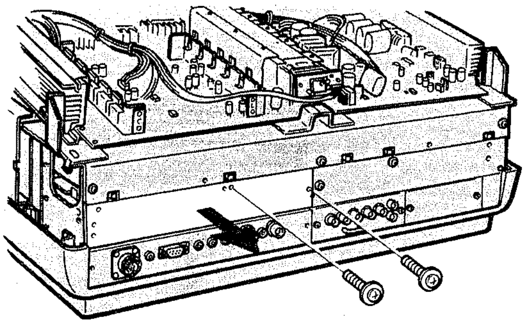
Selecting the internal switch

1 **Open the hood.**

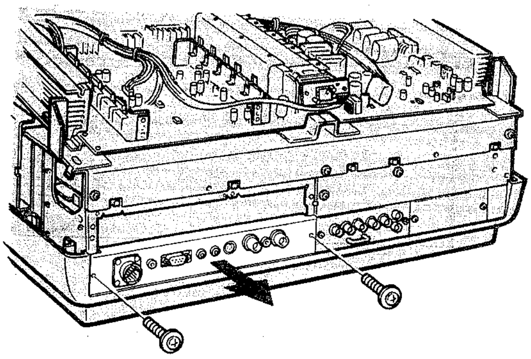
2 **Remove the three screws on the upper part of the connector panel frame and remove it.**



3 **Remove the two screws on the upper part of the VIDEO connector panel and remove the cover.**

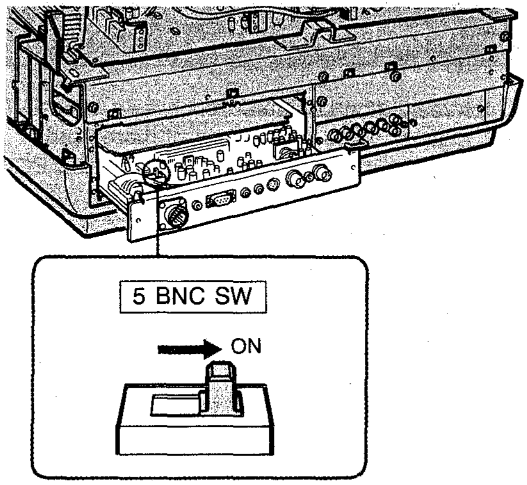


4 **Remove the screws on the left and right side of the VIDEO connector panel and pull the panel out toward you.**



To be continued

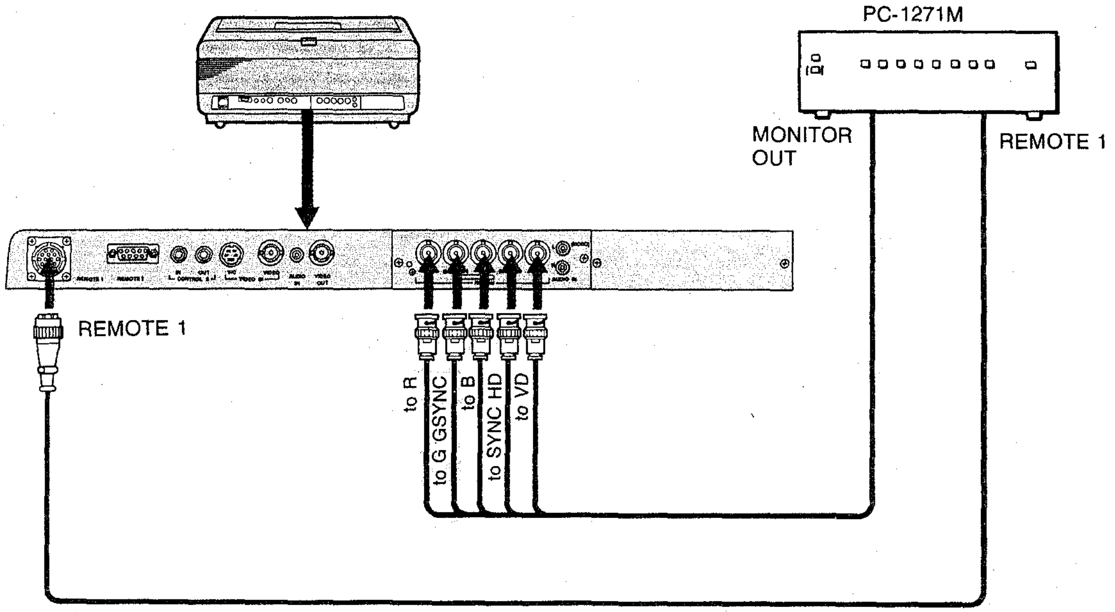
5 **Set the SW1:5BNC SW to ON.**
The switch is on the BB board of the connector panel.



6 **Return the projector to the original condition.**
Follow steps 1 to 4 in reverse.

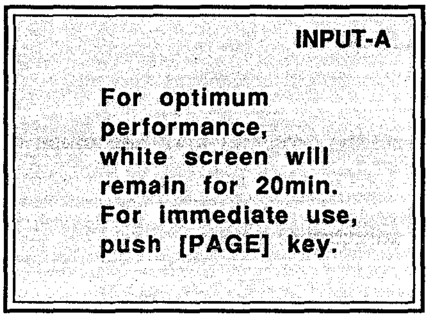
7 **Connect the REMOTE 1 connectors of the projector and switcher with the CCQ BRS cable.**

8 **Connect the RGB IN connectors of the projector and the MONITOR OUT connectors of the switcher with five BNC cables.**


PC-1271M
MONITOR OUT
REMOTE 1
REMOTE 1
to R
to G/GSYNC
to B
to SYNC HD
to VD

1-10. BEFORE STARTING ADJUSTMENT

Before you perform the registration adjustment, make sure to warm up the projector for 20 minutes after power ON.
For optimum performance, the projector is designed with a warm-up period of about twenty minutes after you turn on the power. During this period, it displays a white screen with the message shown below. Thirty-five seconds after the warming up starts, the message will disappear temporarily and will be subsequently displayed at 30-second intervals for 5 seconds at a time.



INPUT-A

For optimum
performance,
white screen will
remain for 20min.
For immediate use,
push [PAGE] key.

If you want to see the picture input from the equipment connected to the projector at once after completing the adjustment, press the PAGE key.
You may set the projector for a shorter warming up period or for immediate projection of the picture input.

1-11. REMOTE CONTROL OPERATION

All of the adjustments except lens focus can be carried out by using the supplied RM-1271 Remote Commander. Normally, the adjustment keys on the Remote Commander are provided with a protection and are inoperable. Before making adjustments, cancel the protection.

Since the RM-1271 is an infrared type, it can be used without a wire. However, in order to correctly control the projector, connecting the projector and the Remote Commander with the remote control cable supplied is recommended.

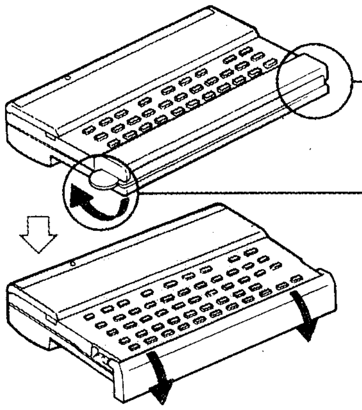
Preparation

1 **Insert three size R6 (AA) batteries with the polarity lined up correctly.**

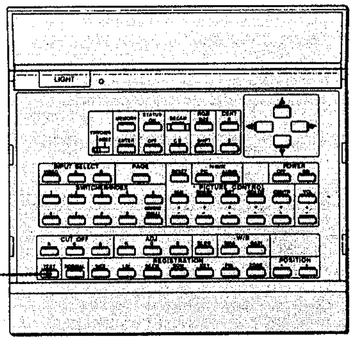
2 **Connect the Commander to the projector.**

3 **Press the MAIN POWER switch on the projector and then press the POWER ON key on the Commander.**

4 **Remove the panel cover of the adjustment keys.**



Open with a coin or a similar.



TEST

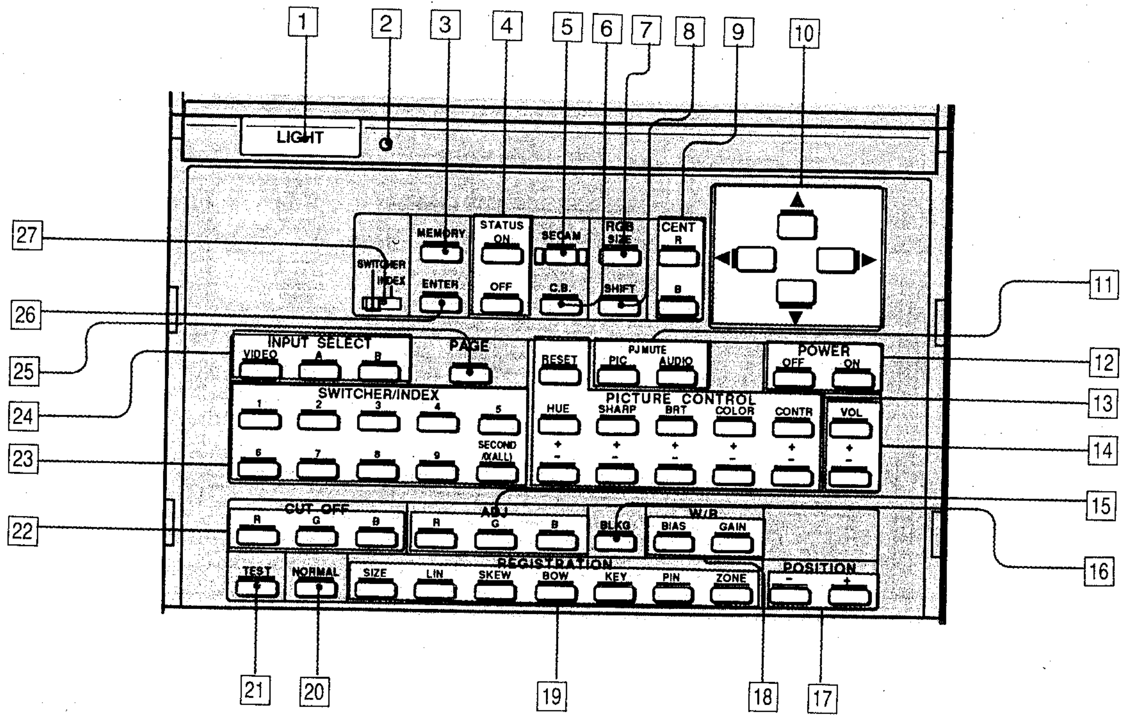
5 **Keep pressing the TEST key for 5 seconds.**
The display will appear.

Do you wish to enter into the SERVICEMAN CONTROL MODE?

YES : ▲
NO : ▼

6 **Press the ▲ key.**
The protection on the adjustment keys is cancelled and the adjustment keys will function.
After adjustment, activate the protection again

Keys on the Commander


1
2
3
4
5
6
7
8
9
10
LIGHT
MEMORY
ENTER
STATUS
ON
OFF
SECAM
C.B.
RGB
SIZE
SHIFT
CENT
R
B
SWITCHER
INDEX
INPUT SELECT
VIDEO
A
B
PAGE
RESET
PJ MUTE
PIC
AUDIO
POWER
OFF
ON
SWITCHER/INDEX
1
2
3
4
5
6
7
8
9
SECOND
/0(ALL)
PICTURE CONTROL
HUE
SHARP
BRT
COLOR
CONTR
VOL
+
-
CUT OFF
R
G
B
ADJ
R
G
B
BLKG
W/B
BIAS
GAIN
REGISTRATION
TEST
NORMAL
SIZE
LIN
SKEW
BOW
KEY
PIN
ZONE
POSITION
-
+
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27

1 LIGHT button

Press to light key indicators.
If the keys are not operated within about 30 seconds, the light automatically goes out.

2 Transmission indicator

The light goes on each time a key is pressed. When the indicator does not light, replace the batteries.

3 MEMORY key

Press to store various adjustment data into memory.

4 STATUS ON/OFF key

Press **OFF** to eliminate the "On-Screen display". Press **ON** to restore the on-screen display.
Note: The PAGE display appears even when the **OFF** key is pressed.

5 SECAM key

When SECAM signal is input to the projector and you cannot get normal color, press this key. Press again to switch over to the other standard system sources, NTSC or PAL.

6 C.B. (clear blue) key

Press to make the blue color clear in RGB mode. Press again to restore the normal condition.

7 RGB SIZE key

Press to adjust the size of the picture for the video and RGB signal inputs.
Press this key to enter the size adjustment mode.
The size adjustment is performed using the four arrow keys.

◀ .... to reduce the horizontal size
▶ .... to expand the horizontal size
▲ .... to expand the vertical size
▼ .... to reduce the vertical size

8 RGB SHIFT key

Press to adjust the shift of the picture for the RGB signal input.
Press this key to enter the size adjustment mode.
The shift adjustment of the picture is performed using the four arrow keys. The picture shifts according to the direction of the arrow.

Note

This key does not function with the video signal input.

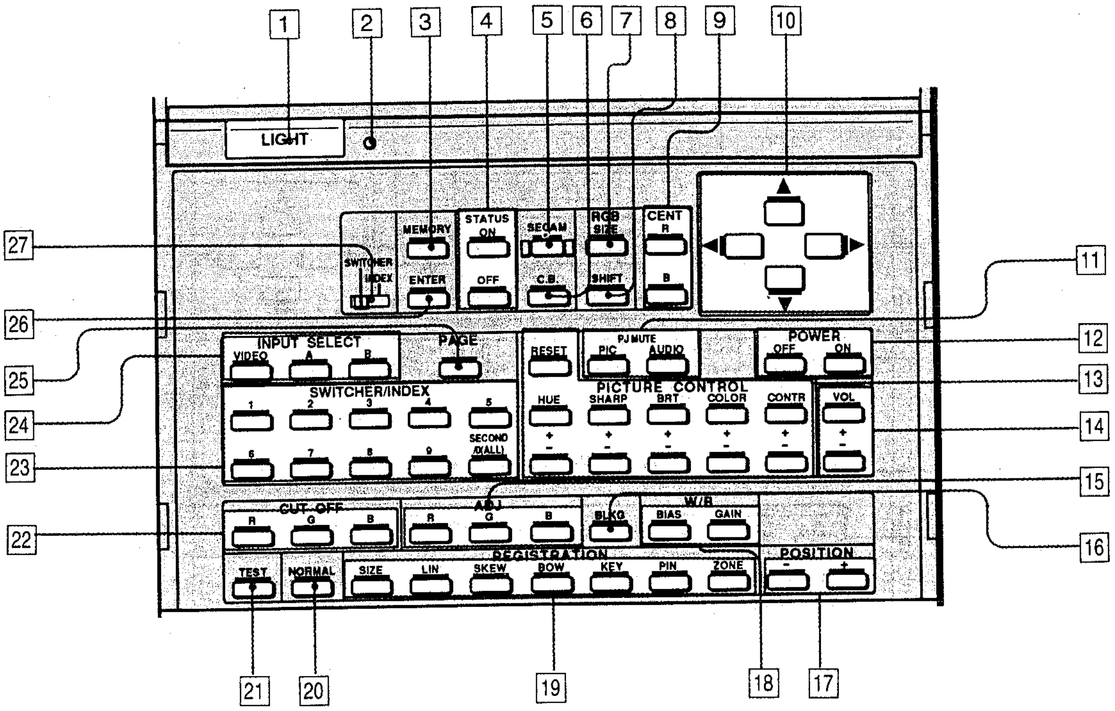
9 CENT R/B keys

Press to enter the centering adjustment mode of the red and blue.

CENT R: Press to enter the red centering adjustment mode.
CENT B: Press to enter the blue centering adjustment mode.

Centering adjustments are performed using the four arrow keys.

Keys on the Commander


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
LIGHT
MEMORY
ENTER
STATUS
ON
OFF
SECAM
C.B.
RGB SIZE
SHIFT
CENT
R
B
SWITCHER
INDEX
INPUT SELECT
VIDEO
A
B
PAGE
RESET
PJ MUTE
PIC
AUDIO
POWER
OFF
ON
SWITCHER/INDEX
1
2
3
4
5
6
7
8
9
SECOND (ALL)
PICTURE CONTROL
HUE
SHARP
BRT
COLOR
CONTR
VOL
CUT OFF
R
G
B
ADJ
R
G
B
BLKG
W/B
BIAS
GAIN
REGISTRATION
TEST
NORMAL
SIZE
LIN
SKEW
BOW
KEY
PIN
ZONE
POSITION
-
+

10 **Arrow keys**
The keys are used for various adjustment functions.

11 **PJ MUTE keys**
PIC: Press to cut off the picture. To restore the picture, press it again or CONTR +.
AUDIO: Press to cut off the sound. To restore the sound, press it again or VOL +.

12 **POWER ON/OFF keys**
Press to turn on and off the projector.

13 **PICTURE CONTROL keys**
Press to adjust picture condition: hue, sharpness, brightness, color, and contrast. Press RESET to restore the standard levels.

14 **VOL (volume) +/– keys**
Press to adjust volume.
+: to increase volume
–: to decrease volume

15 **ADJ R/G/B (adjust red/green/blue) keys**
Press to select color to be adjusted when adjusting the registration.
R . . . Red signal
G . . . Green signal (Servicing only. If you change the green signal setting, perform the factory reset operation.)
B . . . Blue signal

16 **BLKG (blanking) key**
Press to enter the blanking adjustment mode.
The adjustment can be performed using the four arrow keys.

17 **POSITION +/– keys**
Used for zone adjustment and the blanking adjustment.

18 **W/B (white balance) key**
Press to enter the white balance adjustment mode.
BIAS: For cut off adjustment
GAIN: For drive adjustment

19 REGISTRATION keys SIZE/LIN/SKEW/BOW/KEY/PIN/ZONE

Press to select the desired item for registration adjustment. The registration adjustment is performed using the four arrow keys, ADJ keys and POSITION +/− keys. For details, see "Registration Adjustment."

20 NORMAL key

Press to cancel the test patterns or serviceman control mode.

21 TEST key

Press to display the internal test patterns. Each press of this button displays 8 patterns sequentially. In registration and white balance adjustment mode, appropriate patterns will be displayed for each adjustment.

22 CUT OFF keys

Press to select the color to be turned off when adjusting the registration. Press again to turn on the color.

R . . . Red signal
G . . . Green signal
B . . . Blue signal

23 SWITCHER/INDEX keys

When the SWITCHER/INDEX select switch is set to SWITCHER

When the PC-1271M switcher is connected, select the input from the switcher. The SECOND key is used when two switchers are connected. To select the input from the second switcher (when the switcher's SINGLE/REMOTE 2/ SECOND switch is set to SECOND), press the number keys after pressing SECOND. Number key 9 does not operate.

When the SWITCHER/INDEX select switch is set to INDEX

These keys function when the IFB-101 interface board (not supplied) is attached and multiple projectors are connected. For details, refer to the instructions manual of the IFB-101.

24 INPUT SELECT keys

Press to select the input signal.

VIDEO: to select the signal input from the VIDEO IN (Y/C or VIDEO) connectors
A: to select the signal input from the RGB IN connectors
B: to select the signal input from the connectors of B section (when the optional interface board is attached)

25 PAGE key

Press to display and switch the following five on-screen displays.

PAGE 1: Displays STATUS ON/OFF, PIC MUTE ON/OFF, AUDIO MUTE ON/OFF, CLEAR BLUE ON/OFF, and SECAM ON/OFF.
PAGE 2: Displays the picture conditions; contrast, color, brightness, sharpness and hue and volume level.
PAGE 3: Displays the color temperature level, clamp setting and vertical shift range.
PAGE 4: Displays the input signal conditions; fH, fV, H/C-sync, V-sync, Sync on Green, input signal and registration memory block assignment.
PAGE 5: Displays the current use time of each cathode-ray tube (CRT) and the baud rate setting for communicating via the RS-422.

26 ENTER key

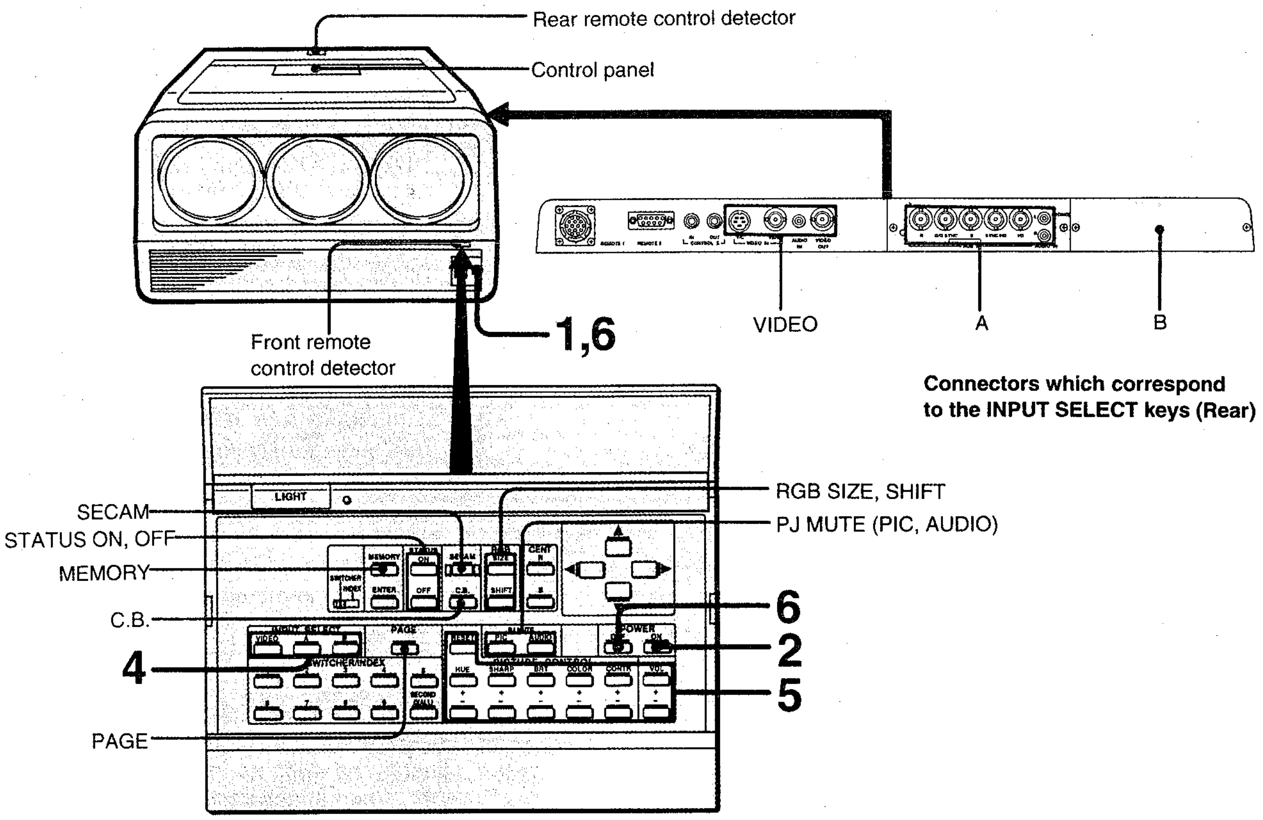
This key functions when the IFB-101 interface board (not supplied) is attached and multiple projectors are connected. For details, refer to the instructions manual of the IFB-101.

27 SWITCHER/INDEX select switch

Selects the SWITCHER/INDEX key function. When using as the switcher input selector, set to SWITCHER. When attaching the IFB-101 interface board at the rear of the projector and controlling multiple projectors, set to INDEX.

1-12. PROJECTING

You can also use the keys on the control panel with the same name as the Remote Commander to operate the projector.


Rear remote control detector
Control panel
Front remote control detector
1,6
VIDEO
A
B
Connectors which correspond to the INPUT SELECT keys (Rear)
RGB SIZE, SHIFT
PJ MUTE (PIC, AUDIO)
SECAM
STATUS ON, OFF
MEMORY
C.B.
4
PAGE
6
2
5
LIGHT

1 **Depress the MAIN POWER switch of the projector (▬ ON).**

2 **Turn on the power by pressing the POWER ON key on the Remote Commander or the control panel of the projector.**

3 **Turn on the connected equipment.**

4 **Select the input signal to be projected by pressing the INPUT SELECT key.**
VIDEO: to select the signal input from the VIDEO IN (Y/C or VIDEO) connectors
A: to select the signal input from the RGB IN connectors
B: to select the signal input from the connectors of "B" section (optional interface board)
When the PC-1271M switcher is connected, set the SWITCHER/INDEX select switch to SWITCHER and then select the input with the SWITCHER/INDEX number keys. If two switchers are connected, first press the SECOND key and then the number key.

5 **Adjust the picture and sound.**

6 **To turn off the power, press the POWER OFF key on the Remote Commander or the control panel of the projector, then press the MAIN POWER switch of the projector.**

To cut the on-screen display

Press the STATUS OFF key.
However, PAGE is displayed even in OFF mode.
To restore the on-screen display, press the STATUS ON key.

To cut off the sound or picture

To mute the sound
Press the PJ MUTE AUDIO key. To restore the previous sound level, press the PJ MUTE AUDIO key again or VOL + key.

To cut off the picture
Press the PJ MUTE PIC key. To restore the previous brightness level, press the PJ MUTE PIC key again or CONTR + key.

If the SECAM color source is incorrect

Press the SECAM key. Press again to switch over to other standard system sources, NTSC or PAL.
If you wish to keep the C.B. ON/OFF or SECAM ON/OFF setting, press the MEMORY key

Notes on projecting a picture input from the VIDEO IN connectors

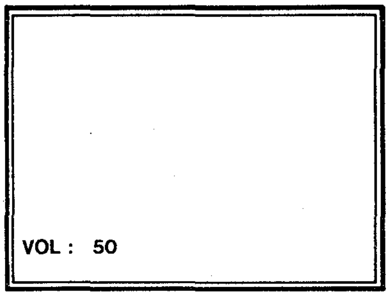
- You can adjust the size of the picture using the RGB SIZE and arrow keys.
- The shift of the picture cannot be adjusted.

Notes on projecting a picture input from the RGB IN connectors

- To make the blue color clear, press the C.B. key. Press again to restore the normal condition.
- If necessary, adjust the size and shift of the picture using the RGB SIZE/SHIFT and arrow keys.

Adjusting the Picture and Sound

Use the VOL and PICTURE CONTROL keys on the Remote Commander.
The adjustment levels are digitally displayed on the screen having a range of MIN, 1, 2, . . . , 98, 99, MAX.



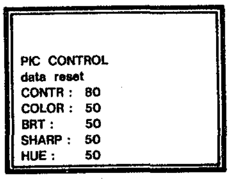
VOL : 50

VOL +/– keys	+: to increase volume –: to decrease volume
CONTR +/– keys	+: to increase picture contrast –: to decrease picture contrast
COLOR +/– keys	+: to increase color intensity –: to decrease color intensity
BRT +/– keys	+: to make the picture brighter –: to make the picture darker
SHARP +/– keys	+: to make the picture sharper –: to make the picture softer
HUE +/– keys	+: to make skin tones greenish –: to make skin tones purplish

- The COLOR, SHARP and HUE controls do not function on the picture input from the RGB IN connectors.
- The HUE control does not function with the PAL or SECAM color source.

To restore the factory preset levels

Press the RESET key.
The factory preset levels will be displayed on the screen.



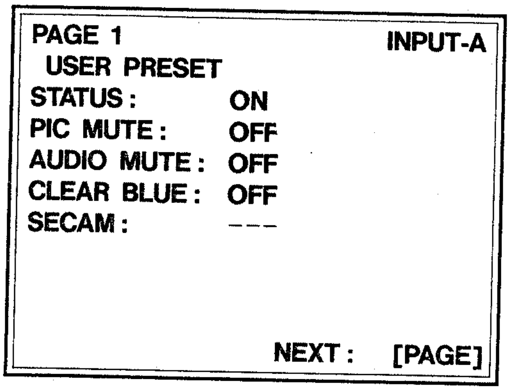
PIC CONTROL
data reset
CONTR : 80
COLOR : 50
BRT : 50
SHARP : 50
HUE : 50

To Display the Current Control Settings and Conditions

Press the PAGE key for displaying the following five on-screen displays. Adjustment can also be done on PAGE 1, 2, 3 and 5. The displays will switch as follows every time the PAGE key is pressed:
Page 5 will be displayed only during the service-man mode.

PAGE 1 → PAGE 2 → PAGE 3 → PAGE 4 → PAGE 5
↑ Original screen ←

PAGE 1

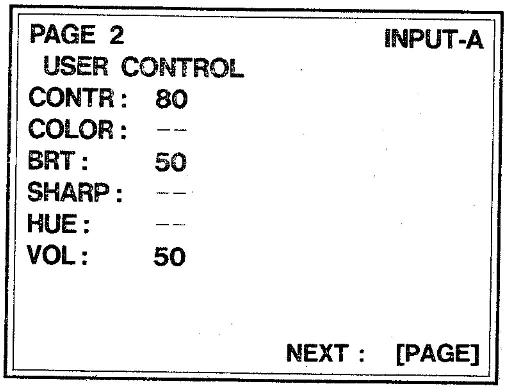


PAGE 1 INPUT-A
USER PRESET
STATUS : ON
PIC MUTE : OFF
AUDIO MUTE : OFF
CLEAR BLUE : OFF
SECAM : ---
NEXT : [PAGE]

STATUS: ON/OFF	The setting is stored even if the power is turned off. When on-screen display does not appear, check if STATUS ON is displayed.
PIC MUTE: ON/OFF	Whenever the power is turned on, PIC MUTE is set to OFF.
AUDIO MUTE: ON/OFF	Whenever the power is turned on, AUDIO MUTE is set to OFF.
CLEAR BLUE: ON/OFF	The setting can be changed for each input signal which differs in any of the items indicated in PAGE 4.
SECAM: ON/OFF	When the PAL color signal is projected with this item set to ON, the picture is displayed in black and white. Make sure to set to OFF when the SECAM color source is not connected.

"- - -" indicates that the control does not function with the current input signal.
To change the settings, adjust with the appropriate key.

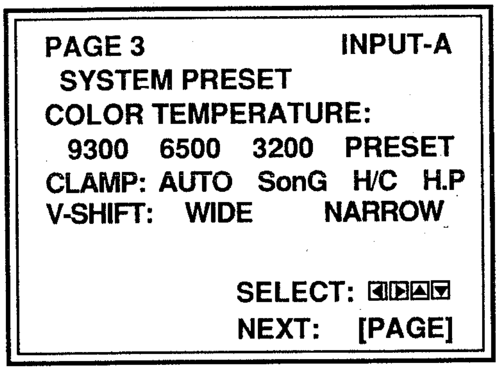
PAGE 2



PAGE 2 INPUT-A
USER CONTROL
CONTR : 80
COLOR : --
BRT : 50
SHARP : --
HUE : --
VOL : 50
NEXT : [PAGE]

The picture conditions; contrast, color, brightness, sharpness, hue and volume level are displayed. The levels can be changed independently for the signal input from different input connectors. (You can check the input connector from the message displayed in the upper right corner of the screen).
"- -" indicates that the control does not function with the current input signal. (In this case, the input signal is RGB.) To change the levels, adjust with the VOL and PICTURE CONTROL keys.

PAGE 3



PAGE 3 INPUT-A
SYSTEM PRESET
COLOR TEMPERATURE:
9300 6500 3200 PRESET
CLAMP: AUTO SonG H/C H.P
V-SHIFT: WIDE NARROW

SELECT: ◀▶▲▼
NEXT: [PAGE]

The color temperature, clamp and vertical-shift adjustment range settings are displayed.
The selected item blinks in green.
To change the setting, adjust by pressing ◀, ▶, ▲ and ▼ keys.

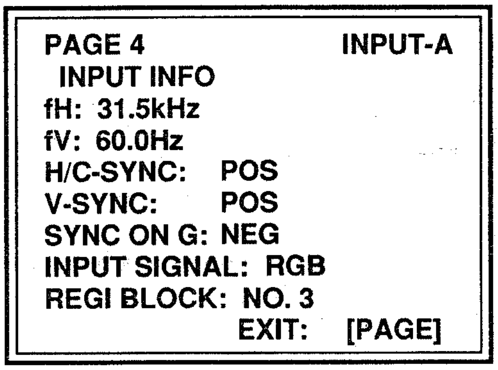
COLOR TEMPERATURE: 9300/6500/3200/PRESET
Normally, set to "6500". If you want to make white color bluish, set to 9300, and if you want to make white color reddish, set to 3200.

V-SHIFT: WIDE/NARROW
Normally set to WIDE. When some particular RGB signal sources are connected, the picture may be distorted vertically. In such case, set to NARROW. Adjustable range in the lower direction will be narrow.

For details of the clamp setting, see "If the luminance of the picture is incorrect–clamp setting".
If you wish to keep the current setting, press the MEMORY key.

Note
"CLAMP" and "V-SHIFT" are not displayed when the input mode is VIDEO.

PAGE 4



PAGE 4 INPUT-A
INPUT INFO
fH: 31.5kHz
fV: 60.0Hz
H/C-SYNC: POS
V-SYNC: POS
SYNC ON G: NEG
INPUT SIGNAL: RGB
REGI BLOCK: NO. 3
EXIT: [PAGE]

The signal input conditions are displayed.

fH: The horizontal frequency of the input signal
fV: The vertical frequency of the input signal
H/C-SYNC: The polarity of the H/C-SYNC
V-SYNC: The polarity of the V-SYNC
SYNC ON G: The polarity of the SYNC on the Green

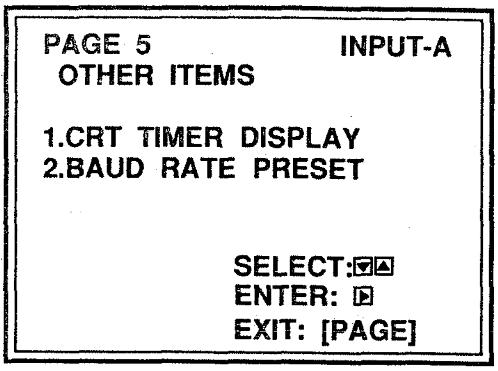
POS: positive
NEG: negative*
– –: no input

* When POS (NEG) is displayed in green:
The picture is being projected using its sync signal.
When POS (NEG) is displayed in white:
The picture is being projected without using its sync signal.

INPUT SIGNAL: The current input signal.
- **Y/C:** S video input signal from VIDEO IN
- **RGB:** RGB input signal
- **NTSC:** NTSC input signal from VIDEO IN
- **PAL:** PAL input signal from VIDEO IN
- **B&W:** Black and white input signal from VIDEO IN
- **Internal oscillation mode:** Internal oscillation mode (No signal is input.)

REGI BLOCK: The registration memory block number in which the input signal is assigned.

PAGE 5



PAGE 5 INPUT-A
OTHER ITEMS

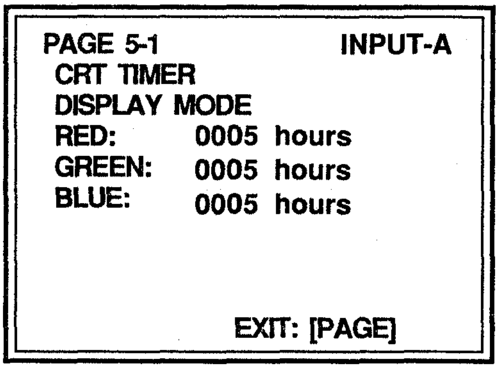
1.CRT TIMER DISPLAY
2.BAUD RATE PRESET

SELECT:▼▲
ENTER: ▶
EXIT: [PAGE]

The two different pages, the current use time of the cathode-ray tubes and the baud rate* setting can be selected to display.
The selected item blinks in green. To display either page, select the item with the ▼ and ▲ keys, and then press the ▶ key.

* The baud rate means the signaling speed when the RS-422 is connected to the projector. The baud rate of the projector should be set to a rate equal to that of the connected computer.

When the "1. CRT TIMER DISPLAY" is selected



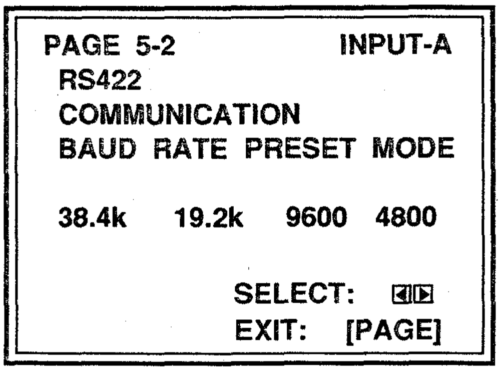
PAGE 5-1 INPUT-A
CRT TIMER
DISPLAY MODE
RED: 0005 hours
GREEN: 0005 hours
BLUE: 0005 hours

EXIT: [PAGE]

The use time of each cathode-ray tube (CRT) is displayed in one-hour intervals.

RED: Use time of red CRT
GREEN: Use time of green CRT
BLUE: Use time of blue CRT

When the "2. BAUD RATE PRESET" is selected



PAGE 5-2 INPUT-A
RS422
COMMUNICATION
BAUD RATE PRESET MODE

38.4k 19.2k 9600 4800

SELECT: ◀▶
EXIT: [PAGE]

The baud rate setting for communicating with the external equipment via the RS-422 is displayed.
The selected item blinks in green. To change the setting, press the ◀ and ▶ keys.

Note
When using with the Sony VPX-010M projector auto set-up system, set to 38.4k.

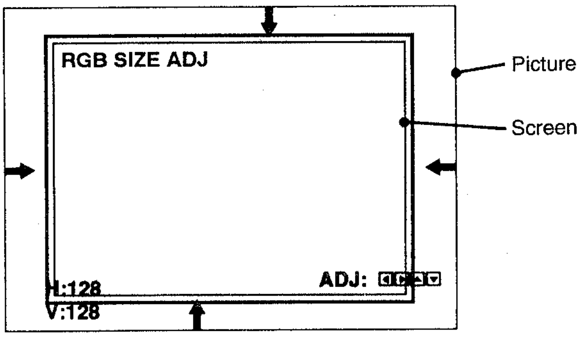
Adjusting the Size And Shift of the Picture

If necessary, adjust the size and shift of the picture using the RGB SIZE/SHIFT and arrow keys.
You can also adjust the size of the picture input from the VIDEO IN connectors using the RGB SIZE and arrow keys.
The SHIFT of the video input signal cannot be adjusted.

If you wish to keep the current adjustment setting, press the MEMORY key.
When the setting is saved in the memory, the display disappears.

RGB/VIDEO SIZE adjustment

If the size of the picture does not fit the screen, adjust RGB SIZE.
In this case the RGB signal is input.



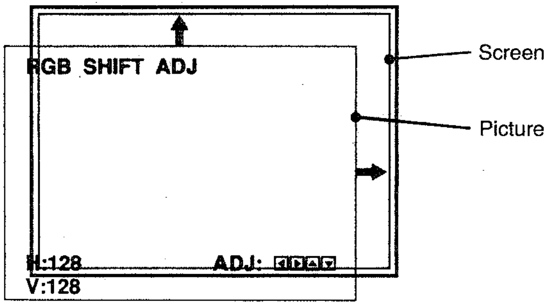
1 **Press the RGB SIZE key.**

2 **Adjust by pressing the arrow keys so that the picture fits the screen.**

◀ to reduce horizontal size
▶ to expand horizontal size
▲ to expand vertical size
▼ to reduce vertical size

RGB SHIFT adjustment

If the RGB picture needs to be shifted to fit the screen, adjust RGB SHIFT.



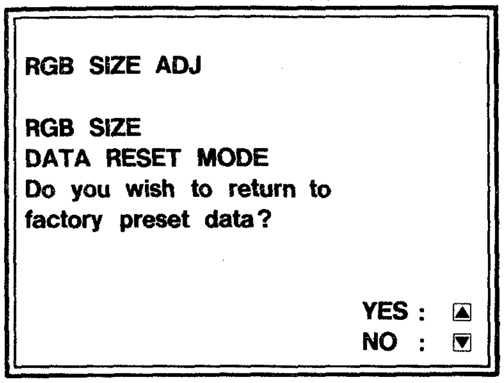
1 **Press the RGB SHIFT key.**

2 **Adjust by pressing the arrow keys so that the picture fits the screen.**
The picture shifts according to the direction of the arrow.

Resetting SIZE/SHIFT to the factory preset condition

1 **Press the RGB SIZE or SHIFT key.**

2 **Press the ◀ and ▶ keys simultaneously.**
The following on-screen display appears on the screen.

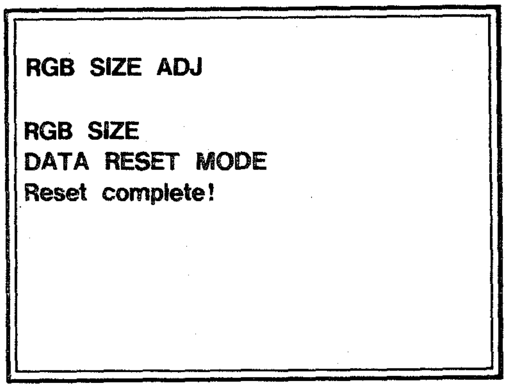


RGB SIZE ADJ

RGB SIZE
DATA RESET MODE
Do you wish to return to
factory preset data?

YES : ▲
NO : ▼

3 **Press the ▲ key.**
The following on-screen display appears on the screen to confirm that resetting was completed.
To keep the current setting instead of resetting, press the ▼ key.



RGB SIZE ADJ

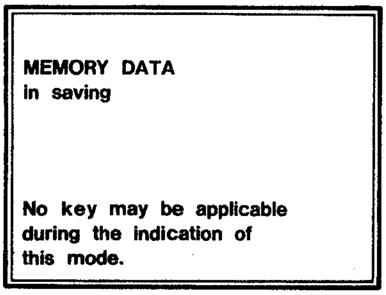
RGB SIZE
DATA RESET MODE
Reset complete!

To Store the Adjustment Levels

If you with to save the picture adjustment changes, you must store them in the memory.
The following conditions can be stored:

SECAM ON/OFF setting
CLEAR BLUE (C.B.) ON/OFF setting
COLOR TEMPERATURE, CLAMP and V-SHIFT adjustment settings on
VIDEO and RGB SIZE adjustment levels
RGB SHIFT adjustment level

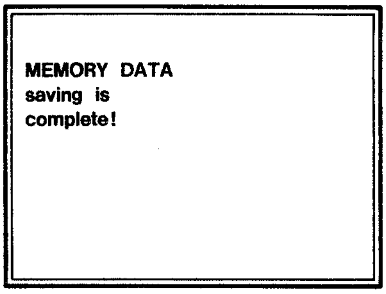
1 **After the adjustment, press the MEMORY key.**
The following on-screen display appears to indicate that storing has begun. While the display is on, no other key will function.



MEMORY DATA
in saving

No key may be applicable
during the indication of
this mode.

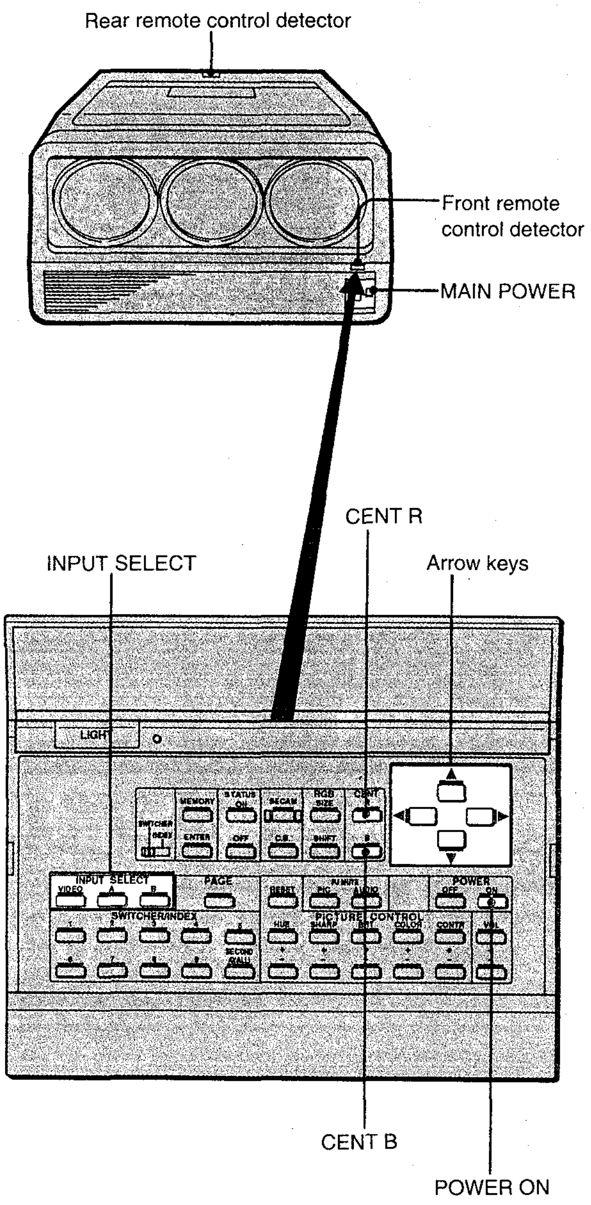
2 The following on-screen display appears to confirm that storing has been completed.



MEMORY DATA
saving is
complete!

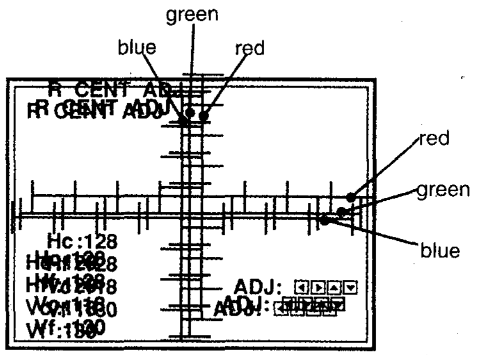
1-13. CENTERING ADJUSTMENT

The three colors, red, green and blue must converge for proper projection. If they do not converge, centering adjustment is necessary.

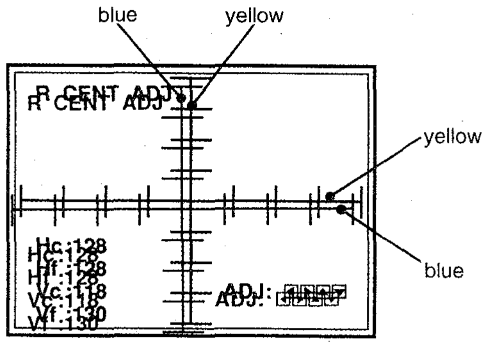

Rear remote control detector
Front remote control detector
MAIN POWER
CENT R
INPUT SELECT
Arrow keys
LIGHT
MEMORY
STATUS ON
SECAM
RGB SIZE
CENT
ENTER
OFF
C.S.
SHIFT
INPUT SELECT
VIDEO
A
B
PAGE
RESET
PIC
AUDIO
POWER
OFF
ON
SWITCHER/INDEX
PICTURE CONTROL
HUE
SHARP
BRT
COLOR
CONTR
VOL
SECOND
CENT B
POWER ON

1 **Press the MAIN POWER switch of the projector and press the POWER ON key of the Remote Commander.**

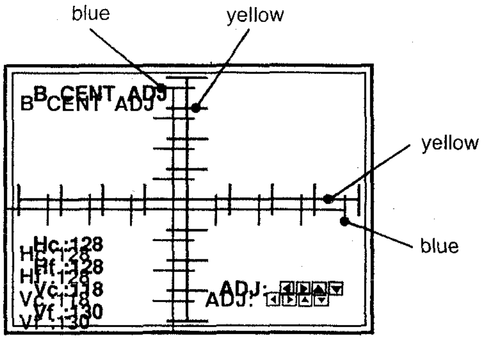
2 **Press the CENT R key.**
The built-in cross hair test pattern will be displayed and the red line will be operable.


green
blue
red
R CENT ADJ
red
green
blue
Hc:128
Hf:128
Vc:118
Vf:130
ADJ:

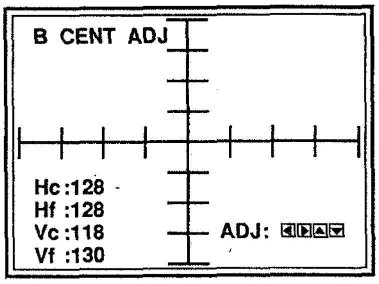
3 **Press the arrow keys to move the red line until the red and green lines converge and are seen as yellow.**
The red line will move according to the direction of the arrow.


blue
yellow
R CENT ADJ
yellow
blue
Hc:128
Hf:128
Vc:118
Vf:130
ADJ:

4 **Press the CENT B key.**
The blue line will be operable.


blue
yellow
yellow
blue
B CENT ADJ
Hc :128
Hf :128
Vc :118
Vf :130
ADJ: ◀▶▲▼

5 **Press the arrow keys to move the blue line until the blue and yellow lines converge.**
When all three color lines converge, the test pattern will be seen as white.


B CENT ADJ
Hc :128
Hf :128
Vc :118
Vf :130
ADJ: ◀▶▲▼

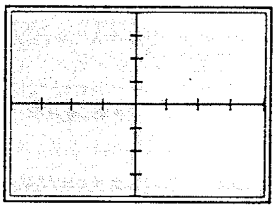
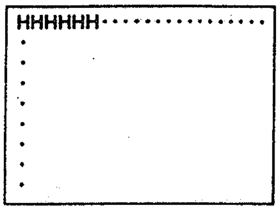
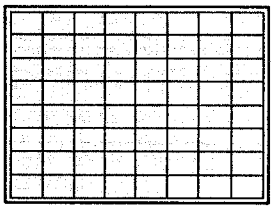
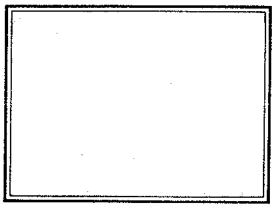
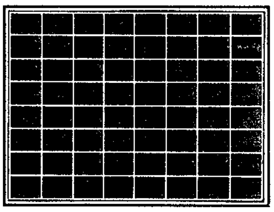
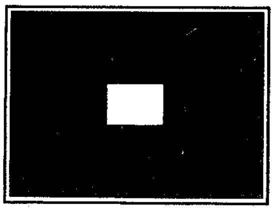
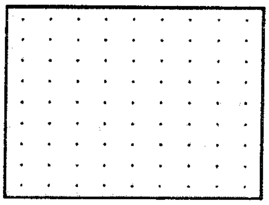
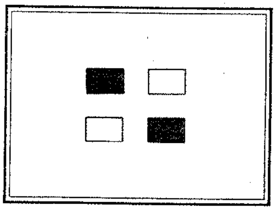
6 **Press the MEMORY key.**
The normal display is restored.

1-14. ADJUSTMENT DISPLAYS AND TEST PATTERNS

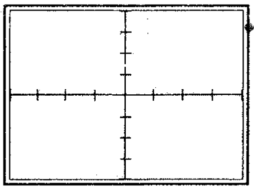
Test Patterns

In each adjustment mode, an appropriate test pattern will be displayed. In addition, other test patterns can be displayed by pressing the TEST key.

All the test patterns

Cross hair 	**H** 
Hatch (9 × 9) 	**White** 
Hatch (reverse) 	**Window** 
Dot 	**PLUGE*** 

*PLUGE = Picture Line Up Generating Equipment



The outside bold line stands for the edge of the screen.

Test patterns in each mode

Mode		With one press of TEST key, test patterns change as follows.	
Normal		Cross hair → Hatch (9 × 9) → Hatch reverse → Dot → H → White → Window → PLUGE → Cross hair	
Registration	SIZE LIN SKEW BOW	Cross hair ↔ Hatch (9 × 9)	Select the desired one.
	KEY PIN	Hatch (5 × 5) ↔ Hatch (9 × 9)	Select the desired one.
	ZONE	Hatch (9 × 9) + Cursor	
White balance	BIAS	PLUGE	
	GAIN	Window ↔ White	
BLKG		Hatch (9 × 9)	
CENT RGB		Cross hair ↔ Hatch (5 × 5)	Select the desired one.

1-15. ADJUSTMENT PROCEDURES

Perform each adjustment with the supplied Remote Commander, first with no input source connected.
After the adjustment, save the data.
Next, perform the fine adjustments for each input signal.

Follow the steps below.

1 **Prepare the Remote Commander.**

2 **Perform adjustments with no input.**
- Focus
- Registration

3 **Save the adjustment data as standard data.**

4 **Perform the fine adjustments for each input signal.**
- Centering
- Registration
- RGB size and shift
- Blanking
- White balance

5 **Save the adjustment data.**

6 **Activate the protection on the Remote Commander again.**

7 **Adjust the picture.**

1-16. LENS FOCUS ADJUSTMENT

Procedure

1. **Remove the top panel.**

↓

2. **Set the Remote Commander to the serviceman adjustment mode by removing the panel cover on the adjustment keys.**

↓

3. **Select the input with no input source connected.**
(NO INPUT mode)

↓

4. **Display the H-pattern.**

↓

5. **Set both CONTR (contrast) and BRT (brightness) levels to 50.**

↓

6. **Adjust the green focus.**

↓

7. **Adjust the red focus.**

↓

8. **Adjust the blue focus.**

↓

9. **Adjust the electric focus.**
(If necessary)

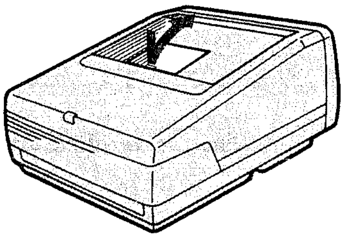
↓

Proceed to the registration adjustment.

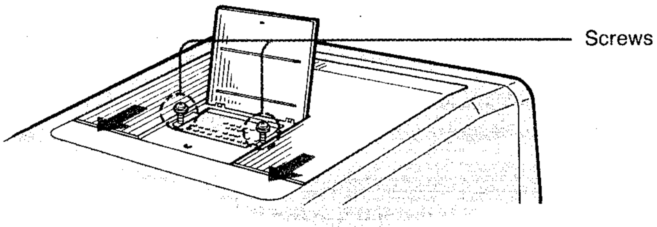
Adjustment

1 **Remove the top panel.**

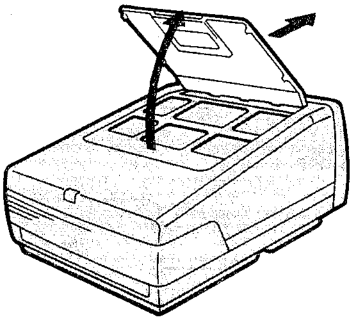
① Push the part marked "PUSH" on the control panel cover to open.



② Loosen two screws (black M4 x 16) of the control panel and slide the top panel in the direction of the arrow.

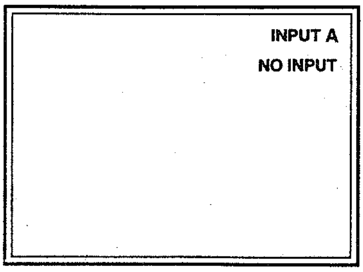


③ Open the top panel towards the lens section to detach.



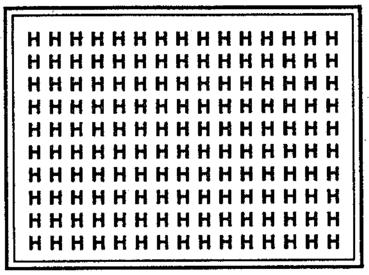
2 **Make the adjustment keys on the Remote Commander operable.**

3 **Select the input with no input source connected.** (NO INPUT mode)
Press the INPUT SELECT A, B or VIDEO key. Or, set the SWITCHER/INDEX select switch to SWITCHER and then from among the number keys from 1 to 8, press a key with no input source connected.
Make sure that "NO INPUT" is displayed on the screen.



4 **Press the TEST key on the Commander five times.**

An H-pattern will appear.



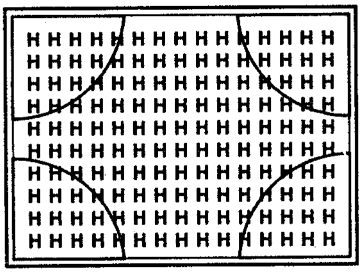
5 **Press PICTURE CONTROL CONTR and BRT +/− keys to set their adjustment levels to 50.**

6 **Adjust the green focus.**

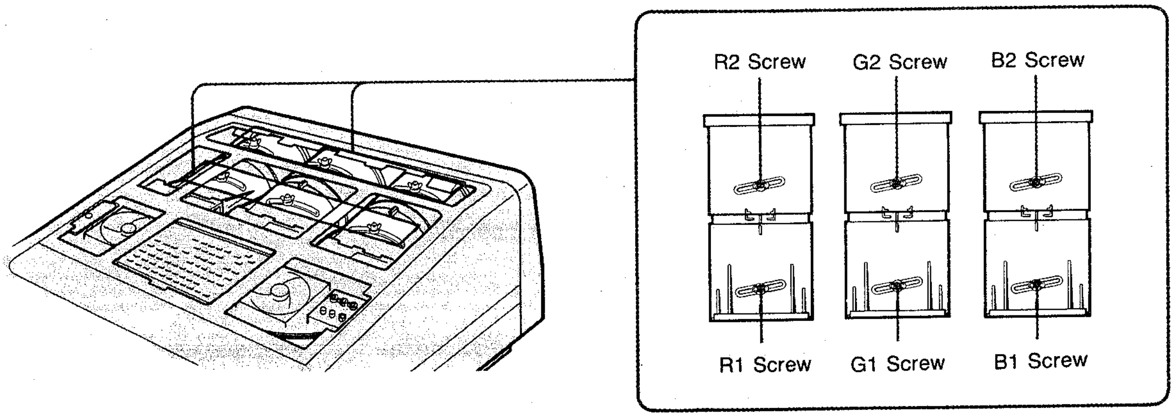
① Press the CUT OFF R and B keys to display the green signal only.

② Adjust the center-focus.
Loosen the G1 screw, slide it so that the letters H at the center of the screen is in optimum focus, and then tighten the screw.

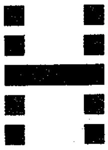
③ Adjust the corner-focus.
Loosen the G2 screw, slide it so that the letter H at the four corners (pay attention to the areas ◸ in the illustration) are equally in focus, and then tighten the screw.



④ Repeat steps ② and ③ two or three times.



Lens focus adjustment hint
The letter H is made up of dots. If it is in focus, the dots will be clearly seen as in the illustration.



7 Adjust the red focus.

① Press the CUT OFF G and B keys to display the red signal only.
② Adjust the red center-focus using the R1 screw following the same procedure as for the green focus.
③ Adjust the red corner-focus using the R2 screw following the same procedure as for the green focus.
④ Repeat steps ② and ③ two or three times.

8 Adjust the blue focus.

① Press the CUT OFF G and R keys to display the blue signal only.
② Adjust the blue center-focus using the B1 screw following the same procedure as for the green focus.
③ Adjust the blue corner-focus using the B2 screw following the same procedure as for the green focus.
④ Repeat steps ② and ③ two or three times.

The lens focus adjustment is complete.
Proceed to the registration adjustment.

Notes

- When you cannot see the letter H clearly as seen in step 6 with the green and red focus adjustments, perform the electric focus adjustment.
- If the focus of the upper, lower, left and right parts is not equal, check that the installation of the projector is correct.

Electric Focus Adjustment

When you cannot obtain sharp focus with the lens focus adjustment, perform only the green and red electric focus adjustments using the controls as shown in the illustration.

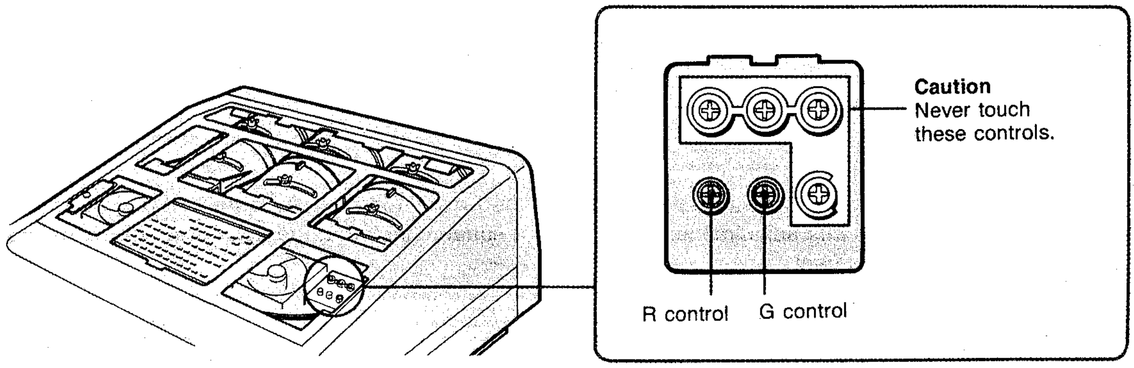
1 **Remove the top panel.**

2 **Press the TEST key five times to display the H-pattern.**

3 **Press the PICTURE CONTROL RESET key to reset the CONTR level to 80 and the BRT level to 50.**

4 **Adjust the green electric focus.**

① Press the CUT OFF R and B keys to display the green signal only.
② Adjust focus by turning the G control.



5 **Adjust the red electric focus.**

① Press the CUT OFF G and B keys to display the red signal only.
② Adjust focus by turning the R control.

Hint 1
Since the focus adjustment level varies with brightness of the screen, set PIC CONTROL to the factory preset levels.

Hint 2
In the case of a high-resolution picture, when it is projected and the adjustment is made, even better focusing is possible. In this case, also, set PIC CONTROL to the factory preset levels.

Blue electric focus adjustment
The blue electric focus is adjusted at the factory. If it is further adjusted, the white balance has to be also readjusted. Never adjust the blue electric focus.

1-17. REGISTRATION ADJUSTMENT

Display the test pattern on the screen and adjust the registration.
Perform green, red and blue adjustments in this order to converge the three colors.

Procedure

1 **Mark the center of the screen.**

↓

2 **Set the Remote Commander to the serviceman adjustment mode.**

↓

3 **Select the input with no input source connected.**
(NO INPUT mode)

↓

4 **Reset the data to the factory preset level.**
(Only when the adjustment data has been saved before)

↓

5 **Check that the shift of a test pattern is correct.**
(Only when the washers were inserted)

↓

6 **Release blanking adjustment.**

↓

7 **Adjust the green registration.**

① Centering adjustment
② SIZE and LIN adjustments
③ SKEW and BOW adjustments
④ KEY and PIN adjustments

↓

8 **Adjust the red registration.**

① Centering adjustment
② SIZE and LIN adjustments
③ SKEW and BOW adjustments
④ KEY and PIN adjustments
⑤ ZONE adjustment

↓

9 **Adjust the blue registration.**

① Centering adjustment
② SIZE and LIN adjustments
③ SKEW and BOW adjustments
④ KEY and PIN adjustments
⑤ ZONE adjustment

10 **Adjust blanking.**

11 **Save the adjusted data as standard data.**

12 **Perform fine adjustments for each input signal**

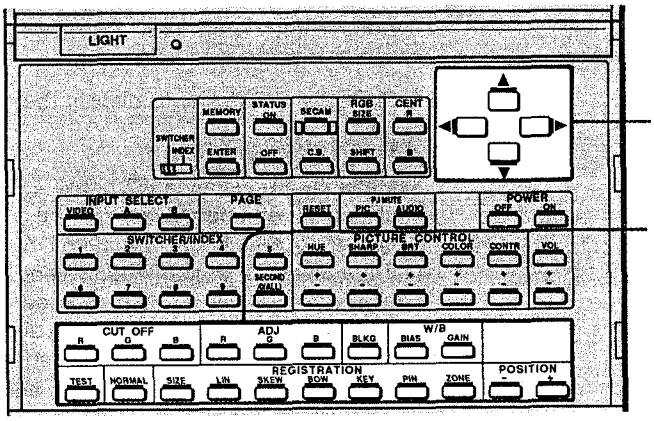
① Adjustment of video input signal
② Adjustment of RGB input signal
③ White balance adjustment

13 **Activate the protection on the Remote Commander.**

14 **Adjust the picture.**

Complete.

Keys for Registration Adjustment


LIGHT
MEMORY
STATUS
ON
SECAM
RGB
SIZE
CENT
R
SWITCHER
INDEX
ENTER
OFF
C.S.
SHIFT
B
INPUT SELECT
VIDEO
A
B
PAGE
RESET
PJ MUTE
PIC
AUDIO
POWER
OFF
ON
SWITCHER/INDEX
1
2
3
4
5
6
7
8
9
SECOND
0(ALL)
PICTURE CONTROL
HUE
SHARP
SAT
COLOR
CONTR
VOL
CUT OFF
R
G
B
ADJ
R
G
B
BLKG
W/B
BIAS
GAIN
REGISTRATION
TEST
NORMAL
SIZE
LIN
SKEW
BOW
KEY
PIN
ZONE
POSITION
-
+

Arrow keys

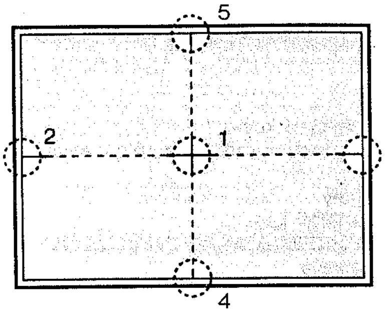
CUT OFF R/G/B keys
ADJ R/G/B (Adjust red/green/blue) keys
TEST key
NORMAL key
REGISTRATION keys
(SIZE/LIN/SKEW/BOW/KEY/PIN/ZONE)
POSITION keys

Identifying the REGISTRATION keys

Indications on the Commander	Adjustment items
SIZE	size
LIN	linearity
SKEW	skew
BOW	bow
KEY	keystone
PIN	pincushion
ZONE	centering, zone

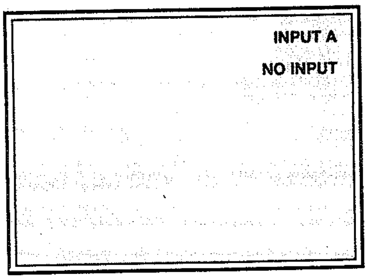
Preparation

1 **Mark the center of the screen.**
Measure the height and width of the screen to decide the center.
Marking five points as illustrated with white tape will help you adjust registration.



2 **Set the Remote Commander to the serviceman adjustment mode.**

3 **Select the input with no input source connected. (NO INPUT mode)**
Press the INPUT SELECT A, B or VIDEO key on the Remote Commander. Or, set the SWITCHER/INDEX select switch to SWITCHER and then from among the number keys from 1 to 8, press a key with no input source connected.
Make sure "NO INPUT" is displayed on the screen.

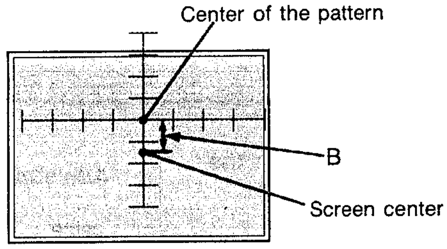


4 **Reset the standard data.**
(Only when the registration adjustment has been performed and the data has been saved before)

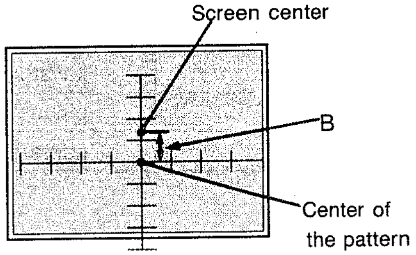
5 **If you install the projector with the washer inserted, check that the distance between the center of the screen and the center of the cross hair pattern is appropriate.**

1 Press the TEST key to display the cross hair pattern.
2 Press the ADJ G key.
3 Measure the distance (B) between the center of the screen and the center of the cross hair pattern. (See the illustrations below.)
If the distance is nearly equivalent to that given in the "List of washers used for non-standard installation", your installation and washer insertion are correctly performed.
If the distance is not equivalent, adjust the angle of optical axis.

Floor installation



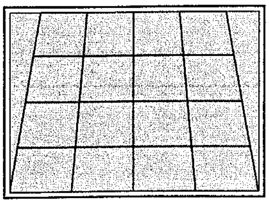
Ceiling installation



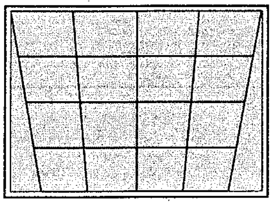
Notes

- The center of the screen and the center of the cross hair pattern can be aligned by performing the centering adjustment.
- When the angle of optical axis is smaller, the hatch pattern becomes trapezoidal. Perform the keystone adjustment to correct the distortion.

Floor installation

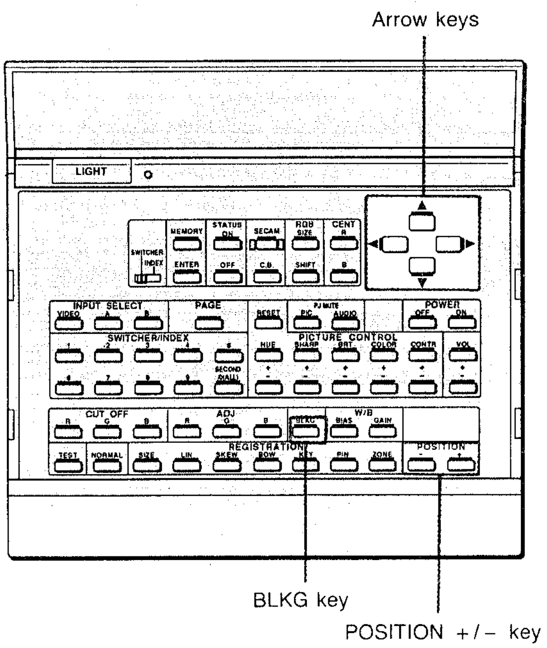


Ceiling installation

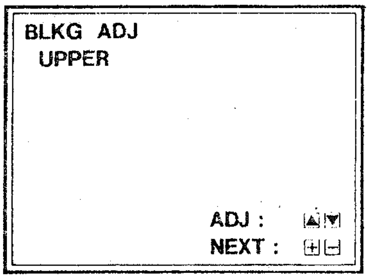


Releasing Blanking Adjustment

The registration adjustment is difficult if the entire test pattern is not visible. Follow the steps below to make the whole test pattern visible.


Arrow keys
LIGHT
MEMORY
STATUS ON
SECAM
RGB SIZE
CENT R
SWITCHER INDEX
ENTER
OFF
C.B.
SHIFT
B
INPUT SELECT
VIDEO
PAGE
RESET
P/C
PJ MUTE
AUDIO
POWER
OFF
ON
SWITCHER/INDEX
PICTURE CONTROL
HUE
SHARP
BRT
COLOR
CONTR
VOL
SECOND
CUT OFF
ADJ
W/B
BIAS
GAIN
REGISTRATION
TEST
NORMAL
SIZE
LIN
SKEW
BOW
KEY
PIN
ZONE
POSITION
BLKG key
POSITION +/– key

1 **Press the BLKG key to enter the blanking adjustment mode.**



BLKG ADJ
UPPER

ADJ : ▲▼
NEXT : ⊞⊟

2 **Press the TEST key once.**
The hatch pattern is displayed.

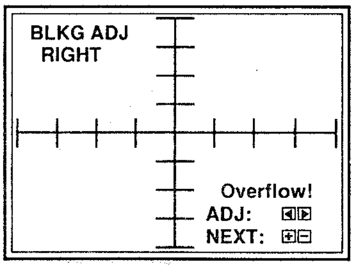
3 **Press the POSITION +/– keys to select the part to be adjusted.**
When the + key is pressed, the position will change as follows:

UPPER → LOWER → LEFT → RIGHT

When the – key is pressed, the position will change in the reverse of the above order.

4 **Press the arrow keys until "Overflow!" is displayed on the screen for each position.**

▲: UPPER, ▼: LOWER, ◀: LEFT, ▶: RIGHT



BLKG ADJ
RIGHT

Overflow!
ADJ: ◀▶
NEXT: ⊞⊟

What is blanking?
Blanking is masking the picture. The picture size of this projector is adjusted at the factory to fit the 120-inch screen. According to the installation method, it is necessary to reduce or increase the masking to fit the picture to the screen. Here, reduce the masking to the minimum (the picture is projected at the largest size), and after the registration adjustment is complete, perform the blanking adjustment to fit the screen used.

Note
There may be a rainbow-like vertical band on the right side or a diagonal line on the upper part of the screen. As they can be adjusted with the blanking adjustment later, leave them alone for now.

Green Registration Adjustment

Be sure to adjust starting with the green test pattern.
When adjusting green, do not perform the ZONE adjustment as far as possible. If the green ZONE adjustment is great, the adjustment of red and blue may be difficult.

1 Green centering adjustment

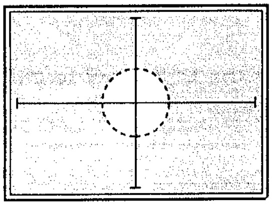
Adjust so that the center of the test pattern is aligned with the center of the screen.

1 **Press the ZONE key.**
The hatch pattern and the cursor are displayed.
If the cursor is not centered, press the POSITION key to move it to the center of the screen.

2 **Press the ADJ G key.**

3 **Press the CUT OFF R and B keys to display green only.**

4 **Press the arrow keys to align the center of the hatch pattern with the center of the screen.**



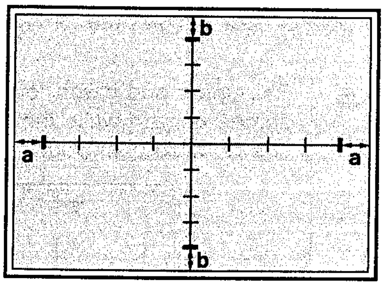
Notes
- At this time perform the ZONE adjustment only for the center zone.
- If the center of the test pattern is off the center of the screen by a large amount, check that the CRT spacers are correctly installed or the installation of the projector is correct.

2 Green SIZE and LIN (linearity) adjustment

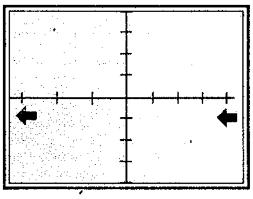
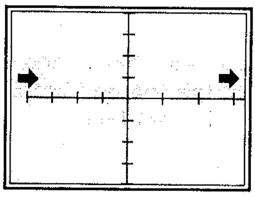
Adjust the size of the displayed picture with respect to the screen, and the picture's up, down, left and right balance.

1 **Press the LIN key.**
You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Press the ADJ G key.**
Pay attention only to the bold lines (the ends of the vertical and horizontal lines).

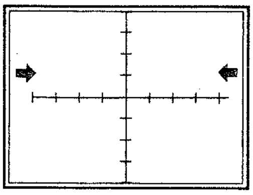
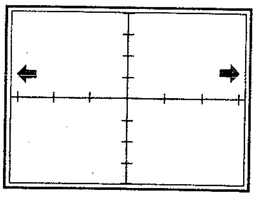


3 **Adjust with the ◀ and ▶ keys until parts (a) on the right and left are of equal length.**

◀	The right and left vertical lines are shifted to the left while the vertical center line remains unmoved. 	▶	The right and left vertical lines are shifted to the right while the vertical center line remains unmoved. 

4 **Press the SIZE key.**

5 **Adjust with the ◀ and ▶ keys until parts (a) on the right and left are 15 — 20 mm long.**

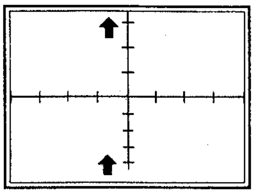
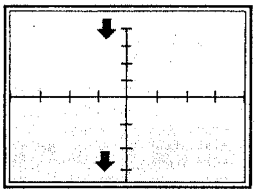
◀	The horizontal size is reduced. 	▶	The horizontal size is expanded. 

6 **If they are not aligned, press the LIN key and repeat steps 3 to 5.**

7 If the center of the cross hair pattern is off-centered on the screen, perform the centering adjustment again and repeat steps 1 to 6 for the horizontal size adjustment.

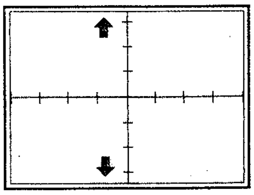
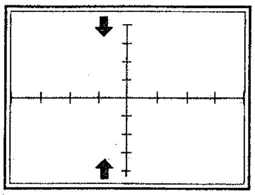
8 Press the LIN key.

9 Adjust with the ▲ and ▼ keys until parts (b) at the top and bottom are of equal length.

▲	The upper and lower horizontal lines are shifted upward while the horizontal center line remains unmoved. 	▼	The upper and lower horizontal lines are shifted downward while the horizontal center line remains unmoved. 

10 Press the SIZE key.

11 Adjust with the ▲ and ▼ keys until parts (b) at the top and bottom are about 15 — 20 mm long.

▲	The vertital size is expanded. 	▼	The vertital size is reduced. 

12 If they are not aligned, repeat steps 8 to 11.

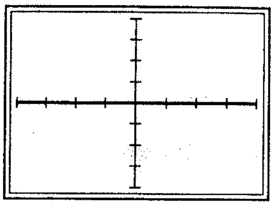
13 If the center of the cross hair pattern is off-centered on the screen, perform the centering adjustment again and then repeat steps 8 to 12 for the vertical size adjustment.

14 After the adjustment is complete, press the MEMORY key to save the data.

3 Green SKEW and BOW adjustments

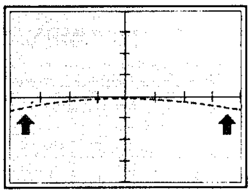
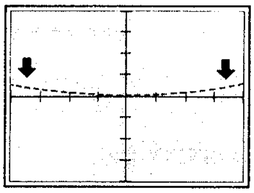
Display the cross hair pattern and adjust the bow-like or skew distortion of the horizontal and vertical center lines to make them parallel to the screen edges.

A. Horizontal line adjustment
Pay attention only to the bold line (horizontal center line).



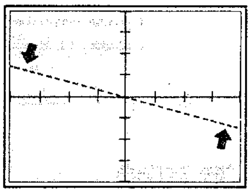
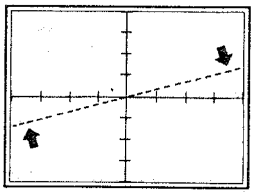
1 **Press BOW key.**
You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Adjust distortion as illustrated below with the ▲ and ▼ keys.**

▲	The right and left sides of the line are curved upward while the center remains unchanged. 	▼	The right and left sides of the line are curved downward while the center remains unchanged. 

3 **Press the SKEW key.**

4 **Adjust distortion as illustrated below with the ▲ and ▼ keys.**

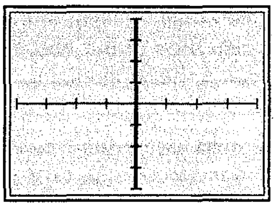
▲	The horizontal line leans toward upper right. 	▼	The horizontal line leans toward lower right. 

5 **Repeat steps 1 to 4 until the horizontal lines become parallel to the screen edges.**

6 **When the adjustment is complete, press the MEMORY key to save the adjustment data.**

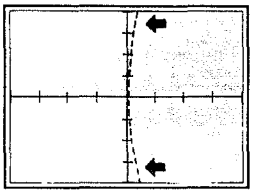
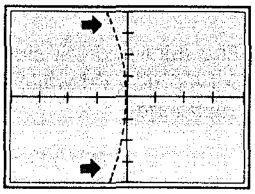
B. Vertical line adjustment

Pay attention only to the bold line (vertical center line).



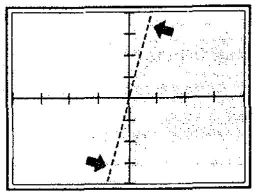
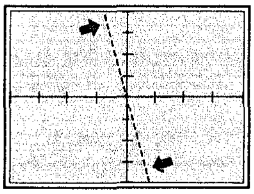
1. **Press BOW key.**

2. **Adjust distortion as illustrated below with the ◀ and ▶ keys.**

◀	The upper and lower parts of the line are curved leftward while the center remains unchanged. 	▶	The upper and lower parts of the line are curved rightward while the center remains unchanged. 

3. **Press the SKEW key.**

4. **Adjust distortion as illustrated below with the ◀ and ▶ keys.**

◀	The vertical line leans leftward. 	▶	The vertical line leans rightward. 

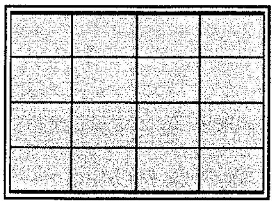
5. **Repeat steps 1 to 4 until the vertical line becomes parallel to the screen edges.**

6. **When the adjustment is complete, press the MEMORY key to save the adjustment data.**

4 Green KEY (keystone) and PIN (pincushion) adjustments

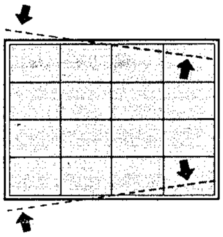
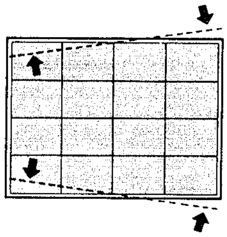
Adjust the trapezoidal distortion and the pin-cushion distortion in the vertical and horizontal directions.

A. Horizontal line adjustment
Pay attention only to the bold lines (top and bottom horizontal lines).



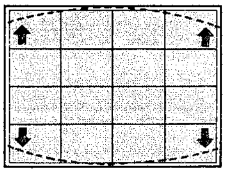
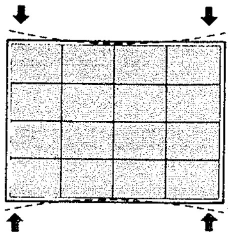
1 **Press the KEY key.**
You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Adjust distortion as illustrated below with the ▲ and ▼ keys.**

▲	The lines spread apart on the right side and come together on the left side. 	▼	The lines spread apart on the left side and come together on the right side. 

3 **Press the PIN key.**

4 **Adjust distortion as illustrated below with the ▲ and ▼ keys.**

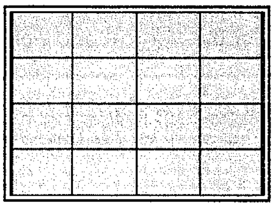
▲	The ends of the top and bottom lines spread apart. 	▼	The ends of the top and bottom lines come together. 

5 **Repeat steps 1 to 4 until the horizontal lines become parallel to the screen edges.**

6 **When the adjustment is complete, press the MEMORY key to save the adjustment data.**

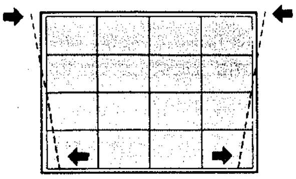
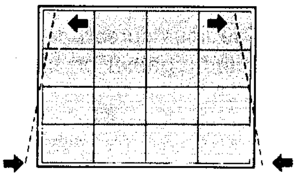
B. Vertical line adjustment

Pay attention only to the bold lines (right and left side vertical lines).



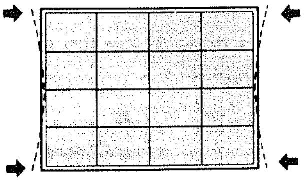
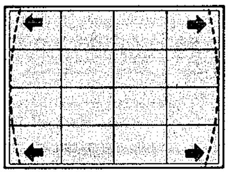
1 **Press the KEY key.**

2 **Adjust distortion as illustrated below with the ◀ and ▶ keys.**

◀	The lines spread apart at the bottom and come together at the top. 	▶	The lines spread apart at the top and come together at the bottom. 

3 **Press the PIN key.**

4 **Adjust distortion as illustrated below with the ◀ and ▶ keys.**

◀	The ends of the right and left side lines come together. 	▶	The ends of the right and left side lines spread apart. 

5 **Repeat steps 1 to 4 to make the vertical lines parallel to the screen edges.**

6 **When the adjustment is complete, press the MEMORY key to save the adjustment data.**

The green registration adjustment is complete.
Proceed to the adjustment for the red signal.

Red Registration Adjustment

Adjust the red signal so that it converges with the green signal and is seen as yellow.

5 Red centering adjustment

Adjust so that the center of the red test pattern is aligned with that of the green pattern.

1 **Press the ZONE key.**
The hatch pattern and the cursor are displayed.
If the cursor is not centered, press the POSITION key to move it to the center of the screen.

2 **Press the ADJ R key.**

3 **Press the CUT OFF B key to display green and red.**

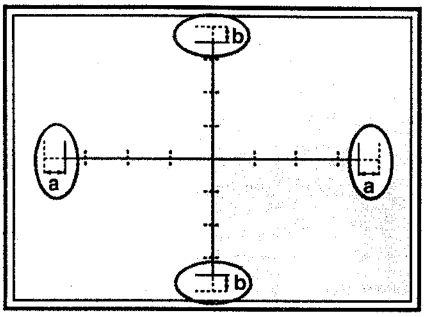
4 **Press the arrow keys to align the center of the red hatch pattern with that of the green pattern.**

Note
At this time perform the ZONE adjustment for the center zone only.

6 Red SIZE and LIN (linearity) adjustments

1 **Press the LIN key.**
You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Press the ADJ R key.**
Pay attention only to the encircled portions.



----: green ——: red

3 **Move the red lines with the ◀ and ▶ keys until parts (a) on the right and left are of equal length.**

◀: The right and left vertical lines are shifted to the left while the vertical center line remains unmoved.
▶: The right and left vertical lines are shifted to the right while the vertical center line remains unmoved.

4 **Press the SIZE key.**

5 **Adjust with the ◀ and ▶ keys so that the red and green lines in the right and left encircled portions converge.**

◀: The horizontal size is reduced.
▶: The horizontal size is expanded.

6 **If adjustment fails, press the LIN key and then repeat steps 3 to 5.**

7 **If the center of the cross hair pattern is off-centered on the screen, perform the centering adjustment again and repeat steps 1 to 6 for horizontal size adjustment.**

8 **Press the LIN key.**

9 **Move the red lines with the ▲ and ▼ keys until parts (b) at the top and bottom are of equal length.**

▲: The upper and lower horizontal lines are shifted upward while the horizontal center line remains unmoved.
▼: The upper and lower horizontal lines are shifted downward while the horizontal center line remains unmoved.

10 **Press the SIZE key.**

11 **Adjust with the ▲ and ▼ keys so that the red and green lines at the top and bottom encircled portions converge.**

▲: The vertical size is expanded.
▼: The vertical size is reduced.

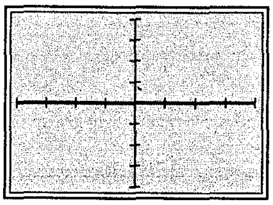
12 **If adjustment fails, repeat steps 8 to 11.**

13 **If the center of the cross hair pattern is off-centered on the screen, perform the centering adjustment again and repeat steps 8 to 12 for vertical size adjustment.**

14 **After the adjustment is complete, press the MEMORY key to save the data.**

7 Red SKEW and BOW adjustments

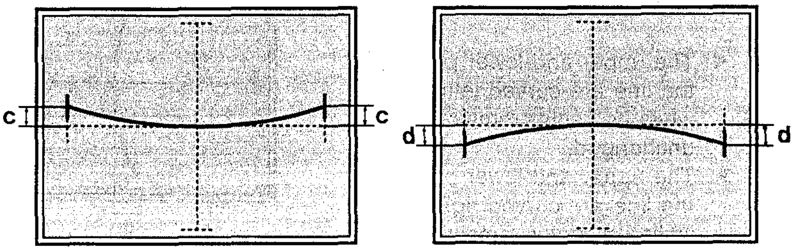
A. Horizontal line adjustment
Pay attention only to the bold line (horizontal center line).



1 **Press the BOW key.**
You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Adjust with the ▲ and ▼ keys so that the vertically distorted parts ⓒ (or ⓓ) on both sides are of equal length.**

▲: The right and left sides of the lines are curved upward while the center remains unchanged.
▼: The right and left sides of the lines are curved downward while the center remains unchanged.

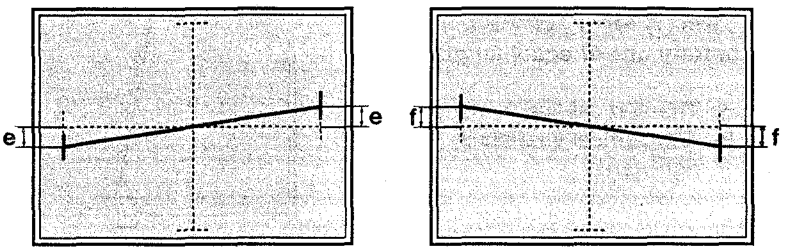


----: green ——: red

3 **Press the SKEW key.**

4 **Adjust with the ▲ and ▼ keys so that the vertically distorted parts ⓔ (or ⓕ) on both sides are of equal length.**

▲: The horizontal line leans toward upper right.
▼: The horizontal line leans toward lower right.



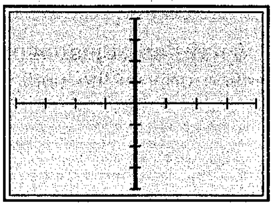
----: green ——: red

5 **Repeat steps 1 to 4 until the red horizontal line converges with the green line.**

6 **When the adjustment is complete, press the MEMORY key to save the adjustment data.**

B. Vertical line adjustment

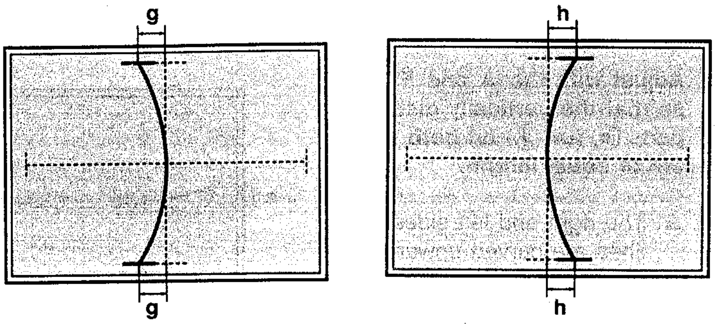
Pay attention only to the bold line (vertical center line).



1 **Press the BOW key.**
You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Adjust with the ◀ and ▶ keys so that the horizontally distorted parts ⓖ (or ⓗ) at the top and bottom are of equal length.**

◀: The upper and lower parts of the line are curved leftward while its center remains unchanged.
▶: The upper and lower parts of the line are curved rightward while its center remains unchanged.

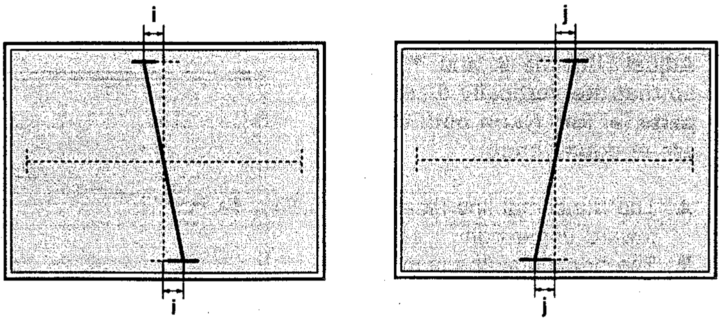


----: green —: red

3 **Press the SKEW key.**

4 **Adjust with the ◀ and ▶ keys so that the horizontally distorted parts ⓘ (or ⓙ) at the top and bottom are of equal length.**

◀: The vertical line leans leftward.
▶: The vertical line leans rightward.



----: green —: red

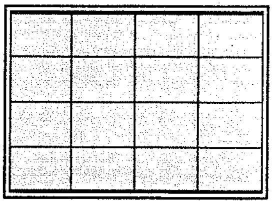
5 **Repeat steps 1 to 4 until the red vertical line converges with the green line.**

6 **When the adjustment is complete, press the MEMORY key to save the data.**

8 Red KEY (keystone) and PIN (pincushion) adjustments

A. Horizontal line adjustment

Pay attention only to the bold lines (top and bottom lines).



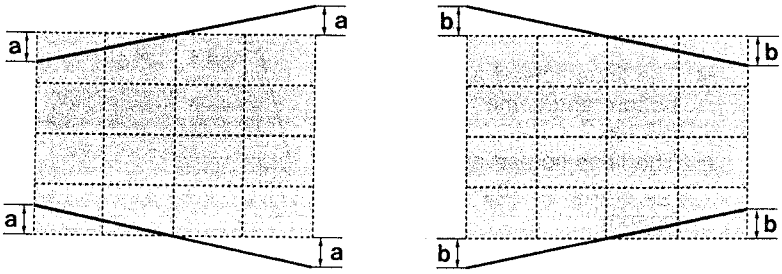
1 **Press the KEY key.**

You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Adjust with the ▲ and ▼ keys so that the vertically distorted parts ⓐ (or ⓑ) are of equal length.**

▲: The lines spread apart on the right and come together on the left.

▼: The lines spread apart on the left and come together on the right.



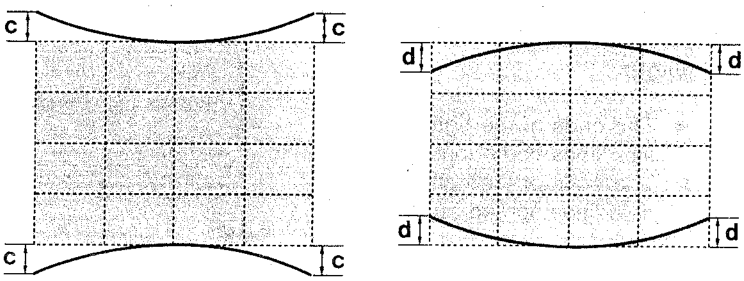
----: green —: red

3 **Press the PIN key.**

4 **Adjust with the ▲ and ▼ keys so that the vertically distorted parts ⓒ (or ⓓ) are of equal length.**

▲: The ends of the top and bottom lines spread apart.

▼: The ends of the top and bottom lines come together.

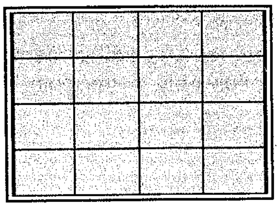


----: green —: red

5 **Repeat steps 1 to 4 until the red horizontal lines converge with the green lines.**

6 **When the adjustment is complete, press the MEMORY key to save the data.**

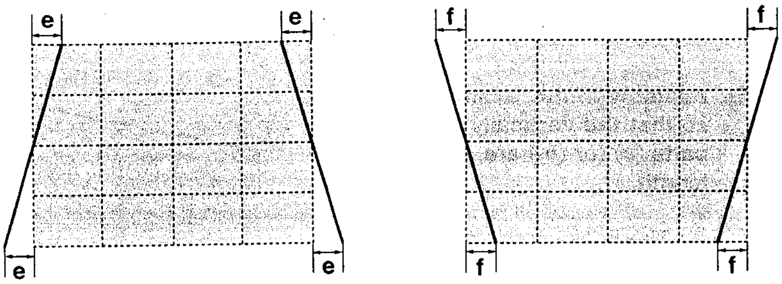
B. Vertical line adjustment
Pay attention only to the bold lines (right and left side lines).



1 **Press the KEY key.**
You can also change to the 9 × 9 hatch pattern by pressing the TEST key.

2 **Adjust with the ◀ and ▶ keys so that horizontally distorted parts ⓔ (or ⓕ) are of equal length.**

◀: The lines spread apart at the bottom and come together at the top.
▶: The lines spread apart at the top and come together at the bottom.

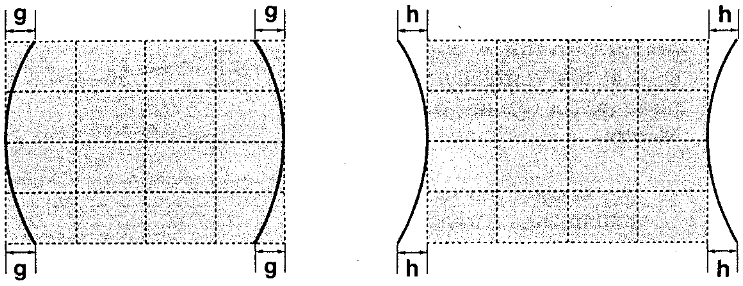


----: green ——: red

3 **Press the PIN key.**

4 **Adjust with the ◀ and ▶ keys so that the horizontally distorted parts ⓖ (or ⓗ) are of equal length.**

◀: The ends of the right and left side lines come together.
▶: The ends of the right and left side lines spread apart.



----: green ——: red

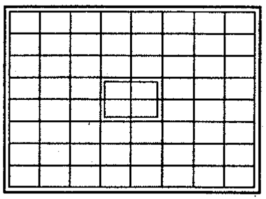
5 **Repeat steps 1 to 4 until the red vertical lines converge with the green lines.**

6 **When the adjustment is complete, press the MEMORY key to save the data.**

9 Red ZONE adjustment

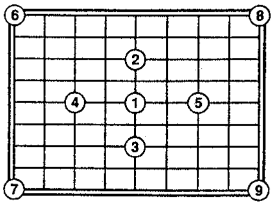
Perform the ZONE adjustment after the red signal has converged with the green signal as far as possible in the red adjustments 5 to 8.

1 **Press the ZONE key.**
The hatch pattern and the cursor are displayed.

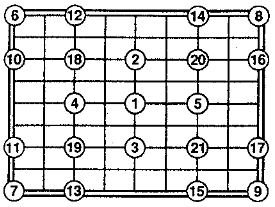


2 **Press the POSITION key to select the part to be adjusted.**
When the + key is pressed, the cursor moves in the numerical order as illustrated.
When the – key is pressed, the cursor moves in the reverse order.
The selected position number will be displayed in the upper right corner.

VPH-1251QM



VPH-1271QM



3 **Adjust the red line distortion in the area of the cursor position with the arrow keys.**

Adjustment hint (only for VPH-1251QM)
After you adjust the distortion in zones 6 to 9, there may still be distortion at a line inside. In this case, adjust equally noting the outermost line and one line inside.

4 **When the adjustment is complete, press the MEMORY key to save the data.**

The red registration adjustment is complete.
Proceed to the registration adjustment of the blue signal.

Blue Registration Adjustment

Adjust the blue signal so that it converges with the red signal which has been adjusted. When the blue and red test patterns converge, the pattern is seen as magenta.

10 Blue centering adjustment

Adjust so that the center of the blue test pattern is aligned with that of the red pattern.

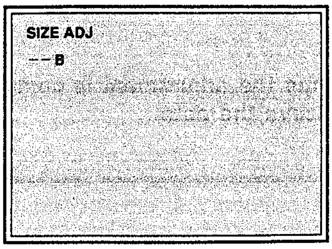
1. **Press the ZONE key.**
2. **Press the ADJ B key.**
3. **Press the CUT OFF G key to display blue and red.**
4. **Press the arrow keys until the center of the blue hatch pattern is aligned with that of the red pattern.**

Note
At this time perform the ZONE adjustment for the center zone only.

11 Blue SIZE, LIN (linearity), SKEW, BOW, KEY (keystone), PIN (pincushion) and ZONE adjustments

Adjust so that the blue signal converges with the red signal in each adjustment. The procedures are the same as for the red registration adjustments

Make sure that "ADJ B" is displayed on the screen when adjusting the blue signal.

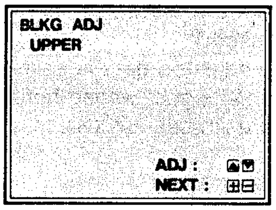


When the blue adjustment is complete, press the MEMORY key to save the adjustment data.

Blanking Adjustment

After the registration adjustments, perform this adjustment to erase a rainbow-like vertical band at the right side or a diagonal line at the upper part of the screen.

1 **Press the BLKG key.**



BLKG ADJ
UPPER

ADJ : ▲▼
NEXT : ⊞⊟

2 **Press the TEST key.**
The hatch pattern is displayed.

3 **Press the POSITION +/− key to select the part to be adjusted.**
When the + key is pressed, the position will change as follows:

UPPER → LOWER → LEFT → RIGHT

When the − key is pressed, the position will change in the reverse of the above order.

4 **Adjust with the arrow keys.**
Press the ▲ and ▼ keys to adjust the UPPER and LOWER parts.
A diagonal line at the upper part will be erased with the UPPER adjustment.
Press the ◀ and ▶ keys to adjust the LEFT and RIGHT parts.
A rainbow-like vertical band at the right side will be erased with the RIGHT adjustment.

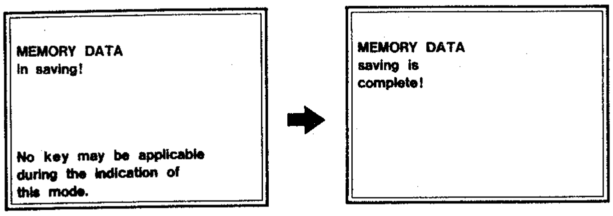
5 **When the adjustment is complete, press the MEMORY key to save the adjustment data.**

Saving the Standard Registration Data

When the registration adjustments for the green, red and blue signals are complete, save the adjusted data as standard data.

1 **Press the MEMORY key. (Do not keep this key pressed.)**
The adjusted data is saved in the memory of an internal signal whose horizontal frequency is approximately 34 kHz.

Note
During saving, other keys do not function.

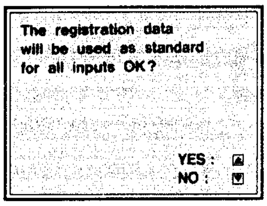


MEMORY DATA
In saving!

No key may be applicable during the indication of this mode.

MEMORY DATA
saving is
complete!

2 **Keep pressing the MEMORY key for more than 3 seconds.**
The message appears and the projector enters the standard data saving mode.



The registration data will be used as standard for all inputs OK?

YES : ▲
NO : ▼

3 **Press the ▲ key (for YES).**
All the registration data will be converted into the data of the internal signal and are saved as standard data.

Note
If the adjustment data are saved as standard data, the registration data with other horizontal frequencies will be converted into the standard data if they have not been saved before.

Memory structure

This projector saves the adjustment data in one of seven (for VPH-1251QM) or eight (VPH-1271QM) memories according to the horizontal frequency of the input signal. The acceptable horizontal frequency is divided into the following blocks with each block assigned to a different memory.

Registration memory block	VPH-1251QM	VPH-1271QM
1	fH = 15 kHz — 19 kHz	fH = 15 kHz — 19 kHz
2	fH = 19 kHz — 24 kHz	fH = 19 kHz — 24 kHz
3	fH = 24 kHz — 30 kHz	fH = 24 kHz — 30 kHz
4	fH = 30 kHz — 37 kHz	fH = 30 kHz — 37 kHz
5	fH = 37 kHz — 45 kHz	fH = 37 kHz — 45 kHz
6	fH = 45 kHz — 58 kHz	fH = 45 kHz — 55 kHz
7	—	fH = 55 kHz — 66 kHz
8	—	fH = 66 kHz — 85 kHz

When a signal is input, its horizontal frequency is automatically detected and the memory is selected. When you perform registration adjustment with no input, the registration adjustment is performed with the projector's internal signal, whose horizontal frequency is approximately 34 kHz. So the adjustment data is saved in registration memory block 4.
If the adjustment data is saved as standard data, the factory preset data for all the memories will be calculated and changed to reflect the new registration information. By this operation the standard data in that installation condition is saved, which makes the subsequent adjustment for each input signal easier.
Follow the two steps below.

1 **After installation, perform registration adjustment with no input and save the adjustment data. Then save the adjusted data as standard data.**
2 **Perform installation adjustment for each input signal and save the adjustment data.**

For reference — Memory architecture

Memory Name	Memory Data	How the projector recognizes data	When data is memorized
Channel Memory	Picture control Video SIZE	Input connector	When the MEMORY key is pressed When the input connector is switched When the power is turned off with the Remote Commander
Status Memory	RGB SIZE, SHIFT Blanking SECAM ON/OFF CLEAR BLUE ON/OFF Color temperature (9300/6500/3200/Preset) V-SHIFT	Horizontal and vertical frequency Condition of sync signal Input connector	When the MEMORY key is pressed When the power is turned off with the Remote Commander
Registration Memory	Registration	Horizontal frequency of the input signal	When the MEMORY key is pressed When the input connector is switched When the horizontal frequency is changed When the power is turned off with the Remote Commander
Color Temperature Memory	W/B Bias and Gain	Status memory	When the MEMORY key is pressed When the input connector is switched When the color temperature is changed When the power is turned off with the Remote Commander

- One projector has only one memory data each for the baud rate, CRT timer and STATUS ON/OFF.

Note
When the adjustment is complete, be sure to press the MEMORY key or turn off the power with the Remote Commander.

1-18. FINE ADJUSTMENT OF EACH INPUT SIGNAL

After the registration adjustment is performed with no input source connected and the adjusted data are saved as standard data, next input an external signal and carry out the fine adjustment and other adjustments for each input signal.

Fine Adjustment of the Video Input Signal

1 **Connect the video signal source.**
Connect to the VIDEO IN jack on the projector or to the PC-1271M switcher connected to the projector.

2 **Select the input to be adjusted.**
Press the INPUT SELECT VIDEO key on the Remote Commander. Or, set the SWITCHER/INDEX select switch to SWITCHER and then from among the number keys from 1 to 8, press a key for a video input source.

3 **Press the PAGE key four times.**
Check that the horizontal frequency of the input signal ("fH") indicates 15.7 kHz.

Fine registration adjustment

1 **Press the TEST key to display the hatch pattern.**

2 **If necessary, perform the fine adjustment.**

3 **When the fine adjustment is complete, press the MEMORY key to save the adjusted data.** (Do not keep it pressed.)
The adjusted value will be saved normally.

SIZE adjustment

Adjust the size of the picture if it does not fit the screen.

1 **Press the RGB SIZE key.**
The video SIZE can be adjusted with the RGB SIZE key.

2 **Adjust with the arrow keys.**

▲: The vertical size is expanded.
▼: The vertical size is reduced.
◀: The horizontal size is expanded.
▶: The horizontal size is reduced.

3 **After the adjustment is complete, press the MEMORY key.**
The adjusted data will be saved.

Blanking Adjustment

If the displayed picture is bigger than the screen, cut off the excess parts.

1 **Press the BLKG key.**

2 **Press the POSITION +/– key to select the part to be adjusted.**
When the + key is pressed, the position will change as follows:

UPPER → LOWER → LEFT → RIGHT

When the – key is pressed, the position will change in the reverse of the above order.

3 **Adjust with the arrow keys.**
Press the ▲ and ▼ keys to adjust the UPPER and LOWER positions.
Press the ◀ and ▶ keys to adjust the LEFT and RIGHT positions.

4 **After the adjustment is complete, press the MEMORY key.**
The adjusted data will be saved.

Note
When two or more video input sources are connected to the projector using the switcher, perform the SIZE and blanking adjustments for each signal input from different input connector.

Fine Adjustment of the RGB Input Signal

1 **Connect the RGB input source.**
Connect to the RGB IN connector on the projector or to the PC-1271M switcher connected to the projector.

2 **Select the input to be adjusted.**
Press the INPUT SELECT A or B key on the Remote Commander. Or, set the SWITCHER/INDEX select switch to SWITCHER and then from among the number keys from 1 to 8, press a key for an RGB input source.

3 **Press the PAGE key four times to check the horizontal frequency ("fH") of the input signal.**
If "fH" indicates 30 — 37 kHz (the range of registration memory block 4), the fine adjustment is not necessary.
For the input signals of other "fH", perform the fine adjustment.

Fine registration adjustment

1 **Press the TEST key to display the hatch pattern.**

2 **If necessary, perform the fine registration adjustment.**

3 **When two or more RGB input sources are connected, group them according to the horizontal frequency by checking the "fH" in PAGE 4 display.**

4 **Perform the fine registration adjustment for each group.**
After the adjustment is complete, press the MEMORY key.
(Do not keep this key pressed.)
The adjusted data will be saved.

Adjustment hint
The projector saves the registration adjustment data in one of seven (for VPH-1251QM) or eight (for VPH-1271QM) registration memory blocks according to the horizontal frequency of the input signals. When two or more signals are input, you need to perform the fine adjustment for each block. If two or more input signals are grouped into the same memory block, perform the adjustment for any one of them. You can check in which block the signal is grouped by displaying.

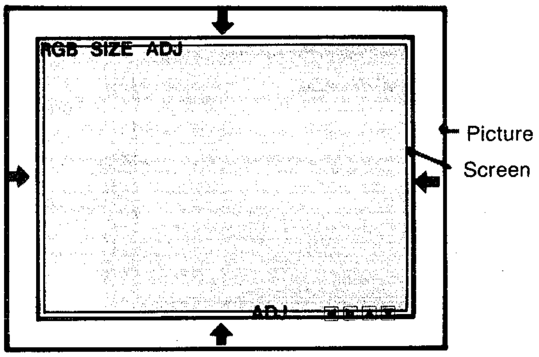
RGB SIZE adjustment

If the size of the picture does not fit the screen, adjust the RGB SIZE adjustment.

1 **Press the RGB SIZE key.**

2 **Adjust with the arrow keys so that the picture fits the screen.**

▲: The vertical size is expanded.
▼: The vertical size is reduced.
◀: The horizontal size is expanded.
▶: The horizontal size is reduced.



3 **When the adjustment is complete, press the MEMORY key.**
The adjusted data will be saved.

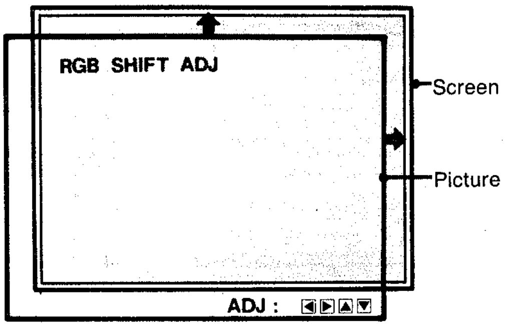
RGB SHIFT Adjustment

If the picture needs to be shifted to fit the screen, adjust the RGB SIZE adjustment.

1 **Press the RGB SHIFT key.**

2 **Adjust with the arrow keys so that the picture fits the screen.**

▲: The picture is shifted upward.
▼: The picture is shifted downward.
◀: The picture is shifted leftward.
▶: The picture is shifted rightward.



3 **When the adjustment is complete, press the MEMORY key.**
The adjusted data will be saved.

Blanking Adjustment

If the displayed picture is bigger than the screen, cut off the excess parts.

1 **Press the BLKG key.**

2 **Press the POSITION +/– key to select the part to be adjusted.**
When the + key is pressed, the position will change as follows:

UPPER → LOWER → LEFT → RIGHT

When the – key is pressed, the position will change in the reverse of the above order.

3 **Adjust with the arrow keys.**
Press the ▲ and ▼ keys to adjust the UPPER and LOWER positions.
Press the ◀ and ▶ keys to adjust the LEFT and RIGHT positions.

4 **When the adjustment is complete, press the MEMORY key.**
The adjusted data will be saved.

Note
When two or more RGB input sources are connected to the projector, perform the size, shift and blanking adjustments for each RGB signal which has any item different from each other in the signal input conditions displayed in PAGE 4.

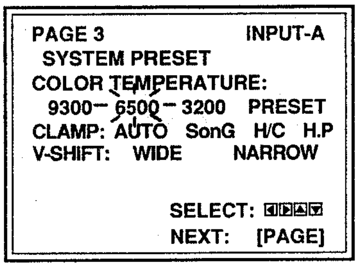
White Balance Adjustment

The color temperatures are preset at the factory to 9300K, 6500K and 3200K. However, if you want to set a color temperature other than the factory-preset levels, you can adjust the white balance and save it in the memory. You can also change the factory-preset levels.

Setting the white balance

1 **Display the same input signal on the projector and the color monitor.**

2 **Press the PAGE key three times to display PAGE 3.**



```
PAGE 3                INPUT-A
 SYSTEM PRESET
COLOR TEMPERATURE:
  9300― 6500 ― 3200  PRESET
CLAMP: AUTO  SonG  H/C  H.P
V-SHIFT:  WIDE      NARROW

                SELECT: ◀▶▲▼
                NEXT:   [PAGE]
```

3 **Press the arrow keys to select 9300, 6500 or 3200, the nearest color temperature to that of the color monitor or the desired one.**
Normally set to 6500. Set to 9300 to make white color bluish and select 3200 to make it reddish.

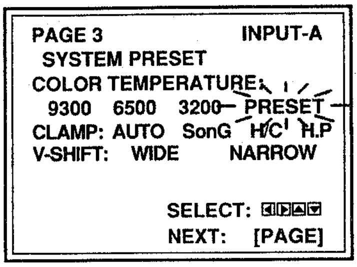
4 **Press the MEMORY key.**

Adjusting the white balance

If you want to make the color of a particular input signal (ex. HDTV system picture) uniform to that of the color monitor, you can adjust the white balance.
Display the same input signal on the projector and the monitor.

1 **Press the PAGE key three times to display PAGE 3.**

2 **Set COLOR TEMPERATURE to PRESET with the arrow keys.**



```
PAGE 3              INPUT-A
 SYSTEM PRESET
COLOR TEMPERATURE:
  9300  6500  3200― PRESET ―
CLAMP: AUTO  SonG  H/C  H.P
V-SHIFT:  WIDE     NARROW

              SELECT: ◀▶▲▼
              NEXT:   [PAGE]
```

3 **Set the contrast and the brightness of the color monitor to the standard levels.**

4 **Adjust the black level.**

① **Press the W/B BIAS key.**
The PLUGE pattern is displayed.
The contrast and the brightness levels of the projector are automatically set to 80 and 50 respectively.

② **Keep pressing the TEST key for more than 5 seconds.**
The picture of the input signal is displayed.

③ **Press the ADJ R, G or B key to select the color to be adjusted.**
In selecting the color, pay attention to the black part of the picture displayed on the projector screen and note which color stands out compared with the same part displayed on the color monitor.

④ **Press the ◀ or ▶ key so that the black color of the picture on the projector looks the same as that on the monitor.**
If the brightness of that part does not look the same as that on the monitor, adjust other colors by pressing the ADJ R, G or B key and arrow keys.

⑤ **Press the MEMORY key.**
The adjusted data is saved.

5 **Adjust the white level.**

① **Press the W/B GAIN key.**
The window pattern is displayed.
The contrast and the brightness levels of the projector are automatically set to 80 and 50, respectively.

② **Keep pressing the TEST key for more than 5 seconds.**
The picture of the input signal is displayed.

③ **Press the ADJ R, G or B key to select the color to be adjusted.**
In selecting the color, pay attention to the white part of the picture displayed on the projector screen and note which color stands out compared with the same part displayed on the color monitor.

④ **Press the ◀ or ▶ key so that the white part of the picture on the projector screen looks the same as that on the monitor.**
If the brightness of that part does not look the same as that on the monitor, adjust other colors by pressing the ADJ R, G or B key and the arrow keys.

⑤ **Press the MEMORY key.**
The adjusted data is saved.

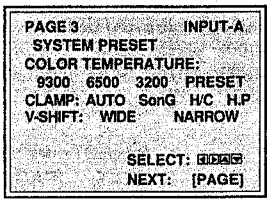
When multiple projectors are used
Input the same signal to the based projector and the projector to be adjusted.
Set COLOR TEMPERATURE on PAGE 3 to the same position on both projectors and then follow steps 4 and 5 in the above procedures to make the black and white colors uniform between the based projector and the other.

Note
You can adjust more easily if you set the COLOR level to MIN to display the black and white picture.

If the Luminance of the Picture is Incorrect — Clamp Setting

Clamp is used as a standard for setting the black level of the picture correctly. The standard position of the clamp depends on the kind of the sync signal. Normally the CPU may judges the signal and sets the clamp position automatically.
However, the CPU may misjudge the signal because of noise. If the luminance of the picture seems to be incorrect (too dark, the black color is too light, or the luminance is unstable), the clamp position may need to be changed.
In such case, change the clamp position following the procedure below.

1 **Press the PAGE key 3 times.**



```
PAGE 3                INPUT-A
 SYSTEM PRESET
COLOR TEMPERATURE:
 9300  6500  3200  PRESET
CLAMP: AUTO  SonG  H/C  H.P
V-SHIFT:  WIDE      NARROW

              SELECT: ◀▶▲▼
              NEXT:   [PAGE]
```

2 **Select the clamp position by pressing ◀, ▶, ▲ and ▼ keys.**

AUTO : Automatic setting mode. Normally, set to this position.
S on G : If the black color is too light or seems to be green, set to this position.
H/C : If the picture is too dark or the luminance is unstable, set to this position.
H.P : If the luminance is still incorrect after changing the clamp setting to "S on G" or "H/C", set to this position and perform H-SHIFT adjustment.

3 **Press the MEMORY key to save the data.**

If the luminance is still incorrect after changing the clamp setting
There may be other problems with the input signal or connection. Check the input signal.

1-19. DATA RESET

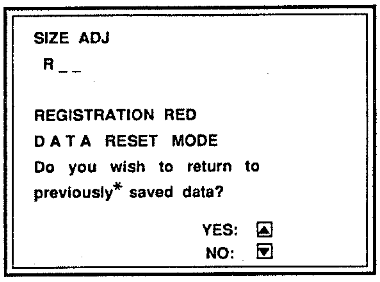
There are two possibilities for data reset, the data reset and factory reset.

Previous data reset	The data are reset to the previously saved data (the data before the adjustment).
Factory reset	The data are reset to the factory preset level. The factory reset can be performed after the previous data reset.

How to Reset the Data

1 **Select the adjustment mode to be reset.**

2 **Press the ◀ and ▶ keys simultaneously.**
The following display appears.

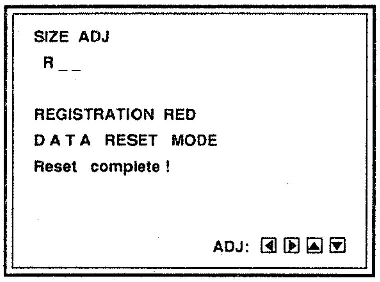


```
SIZE ADJ
 R__

REGISTRATION RED
DATA RESET MODE
Do you wish to return to
previously* saved data?

                 YES: ▲
                 NO:  ▼
```

*Check that "previously" is displayed here.

(ex. To reset the red size adjustment data to the previously saved data)

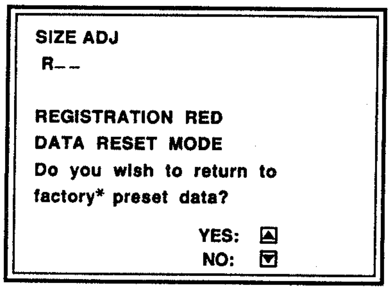
3 **Press the ▲ key.**



```
SIZE ADJ
 R__

REGISTRATION RED
DATA RESET MODE
Reset complete !

             ADJ: ◀ ▶ ▲ ▼
```

The data will be reset to the previously saved data. (**Previous data reset**)

4 **Press the ◀ and ▶ keys simultaneously again.**
The following display appears.



```
SIZE ADJ
 R__

REGISTRATION RED
DATA RESET MODE
Do you wish to return to
factory* preset data?

                 YES: ▲
                 NO:  ▼
```

*Check that "factory" is displayed here.

(ex. To reset the red size adjustment data to the factory preset level)

5 **Press the ▲ key.**
The data will be reset to the factory preset level. (**Factory reset**)

Resetting the Registration Standard Data to the Factory Preset Levels

If the registration data were adjusted and saved, you need reset the data to the factory preset levels before starting the registration adjustment.

1 **Press the CENT R and B keys simultaneously to enter the green centering adjustment mode.**

2 **Follow steps 2 to 5 on page 103.**
The centering adjustment data of the red, green and blue signals are reset to the factory preset levels.

3 **Press the SIZE key.**

4 **Press the ADJ G key and then perform the factory reset operation.**
The SIZE, LIN, SKEW, BOW, KEY, PIN and ZONE adjustment data are reset to the factory preset levels.

5 **Press the ADJ R key and then perform the factory reset operation.**
The SIZE, LIN, SKEW, BOW, KEY, PIN and ZONE adjustment data are reset to the factory preset levels.

6 **Press the ADJ B key and then perform the factory reset operation.**
The SIZE, LIN, SKEW, BOW, KEY, PIN and ZONE adjustment data are reset to the factory preset levels.

7 **Press the BLKG key.**

8 **Press the TEST key and then perform the factory reset operation.**
The UPPER, LOWER, LEFT and RIGHT blanking adjustment data are reset.

The resetting of the standard data to the factory preset levels is complete. Then start the registration adjustment.

For reference — Mode and data reset correspondence

Mode	Data to be reset
RGB Size	H-size and V-size
RGB Shift	H-shift and V-shift
G-centering	Centering data for all colors
R-centering	Not applicable
B-centering	Not applicable
Size, Linearity Skew, Bow Keystone Pincushion	All the registration data for the selected color (including the Zone data)
Zone	Zone data for the selected color is set to the middle adjustment level (128).
Blanking	UPPER/LOWER/LEFT/RIGHT side blanking data
Gain, Bias	All the Bias and Gain data for all colors at the current color temperature

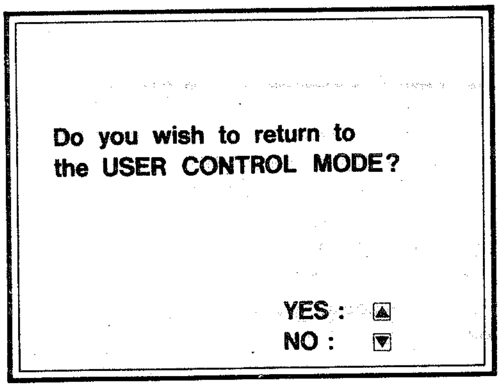
ZONE data reset

The ZONE data reset allows to set the ZONE data of all the positions to 128, middle adjustment level. Perform the ZONE data reset if wavelike distortion occurs with the outermost line of the hatch pattern or the red and blue lines do not converge when adjusting registration (only when the projector is not installed on the floor using the 120-inch front type screen). After the ZONE data reset, start with the KEY and PIN adjustments and then perform the ZONE adjustment again.

1-20. TO ACTIVATE THE PROTECTION ON THE REMOTE COMMANDER

When you turn off the projector with the Remote Commander, the adjustment keys become inoperable in order to prevent the users from changing the registration adjustments.
It is also possible to make the keys inoperable while the power is on in the following way.

1 **Keep pressing the NORMAL key for at least 3 seconds.**



Do you wish to return to
the USER CONTROL MODE?

YES : ▲
NO : ▼

2 **Press the ▲ key.**
The adjustment keys are now inoperable.

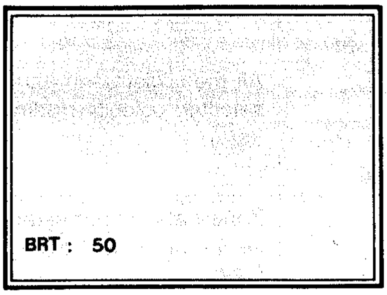
1-21. PICTURE ADJUSTMENT

Adjust the picture for your preference. The adjusted data can be saved in the memory.

1 **Adjust with the PICTURE CONTROL +/− keys.**

CONTR	picture contrast
COLOR	color intensity
BRT	brightness
SHARP	sharpness
HUE	hue

The adjustment levels are digitally displayed having a range of MIN, 1, 2 ... 99, Max.

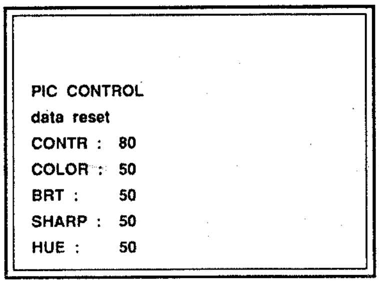


BRT : 50

2 **When the adjustment is complete, press the MEMORY key.**

To restore the factory preset levels

Press the RESET key.
The factory preset levels are displayed on the screen.



PIC CONTROL
data reset
CONTR : 80
COLOR : 50
BRT : 50
SHARP : 50
HUE : 50

Notes

- The COLOR, SHARP and HUE keys do not function on the pictures input from the RGB IN connectors.
- The HUE and COLOR keys do not function if the input signal is black and white.
- The HUE key does not function with the PAL or SECAM color source.

Dynamic picture mode (only for the video input pictures)

You can obtain the picture of high quality contrast by setting the DYNAMIC PIC SW to ON inside the projector. See "Dynamic picture setting."

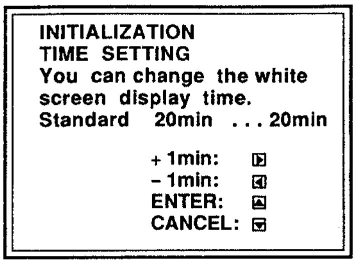
1-22. VARIOUS SETTINGS

Changing the Initialization Time

You can set the period of initializing when the projector warms up to the desired minutes in intervals of 1 minute.

1 **Set the Remote Commander to the serviceman adjustment mode.**

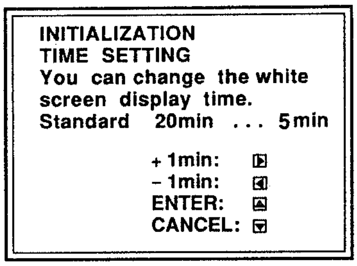
2 **Keep pressing the POWER ON key on the Commander for 5 seconds.**
The following display appears.



INITIALIZATION
TIME SETTING
You can change the white screen display time.
Standard 20min . . . 20min

+1min: ▶
-1min: ◀
ENTER: ▲
CANCEL: ▼

3 **Press the ▶ and ◀ keys to set to the desired minutes.**
▶: to increase by 1 minute
◀: to decrease by 1 minute



INITIALIZATION
TIME SETTING
You can change the white screen display time.
Standard 20min . . . 5min

+1min: ▶
-1min: ◀
ENTER: ▲
CANCEL: ▼

4 **Press the ▲ key.**
The display disappears.

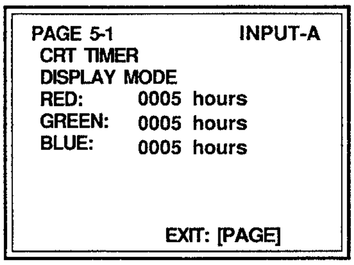
To cancel the setting
Press the ▼ key instead of the ▲ key in step 4.

To set so that the signal input from the connected equipment is displayed on the screen immediately after the power is turned on.
Set to 0 min.

CRT Timer Reset

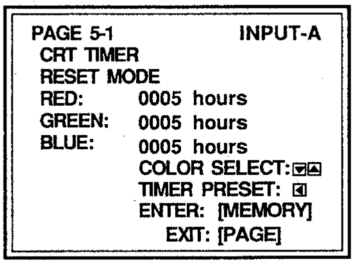
If you replace the cathode-ray tubes, reset their use time to "0000".

1. **Set the Remote Commander to the serviceman adjustment mode.**
2. **Press the PAGE key five times to display PAGE 5.**
3. **Select "1. CRT TIMER DISPLAY" with the ▶ key.**
   The PAGE 5-1 display appears to show the current use time of the cathode-ray tubes for each color.



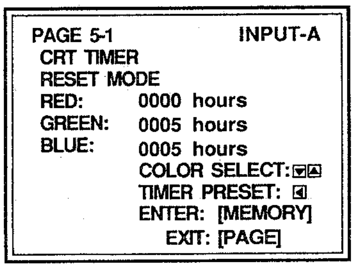
```
PAGE 5-1                INPUT-A
 CRT TIMER
 DISPLAY MODE
 RED:        0005 hours
 GREEN:      0005 hours
 BLUE:       0005 hours


                EXIT: [PAGE]
```

4. **Press the ◀ and ▶ keys simultaneously to enter the CRT timer reset mode.**



```
PAGE 5-1                INPUT-A
 CRT TIMER
 RESET MODE
 RED:        0005 hours
 GREEN:      0005 hours
 BLUE:       0005 hours
             COLOR SELECT:▼▲
             TIMER PRESET: ◀
             ENTER: [MEMORY]
                EXIT: [PAGE]
```

5. **Select the color to be reset with the ▲ and ▼ keys.**
   The selected color blinks.
6. **Press the ◀ key.**
   The blinking timer is reset to 0000.

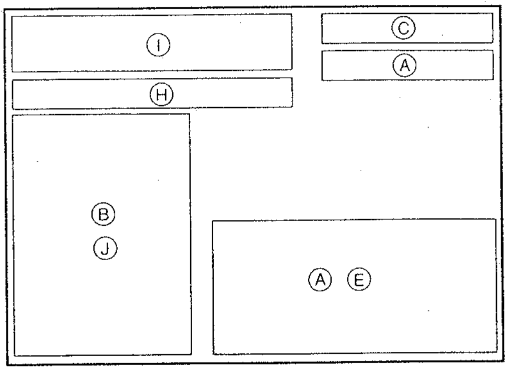


```
PAGE 5-1                INPUT-A
 CRT TIMER
 RESET MODE
 RED:        0000 hours
 GREEN:      0005 hours
 BLUE:       0005 hours
             COLOR SELECT:▼▲
             TIMER PRESET: ◀
             ENTER: [MEMORY]
                EXIT: [PAGE]
```

7. **Repeat steps 5 and 6 for other colors.**
8. **Press the MEMORY key.**

1-23. LIST OF THE MESSAGES

Use the list below to check the meaning of the messages displayed on the screen.
The list is divided into sections depending on the location which the message appears. Check the location first, then refer to the alphabet for the section to find the message.



Ⓓ, Ⓕ, Ⓖ, Ⓚ, Ⓛ and a part of Ⓘ will appear all over the screen.

A Caution, Message

•Not applicable!	•The key is not applicable in the current mode.
•Overflow!	•The adjustment data has passed the adjustable range limit, and does not change any more.
•PIC MUTE	•Picture mute mode is on.
•Input is not VIDEO.	•The input signal is not VIDEO.
•Input is not NTSC.	•The input signal is not NTSC.
•Input is not RGB.	•The input signal is not RGB.
•Input is B & W.	•The input signal is black and white.
•NO INPUT	•No signal is input.

B PIC CONTROL data

•CONTR (CONTRAST)	•Contrast
•COLOR	•Color
•BRT (BRIGHTNESS)	•Brightness
•SHARP (SHARPNESS)	•Sharpness
•HUE	•Hue
•PIC CONTROL data reset	•Resets the PIC CONTROL data.

C Input channel

•VIDEO	•Input from VIDEO IN
•INPUT-A	•Input from optional interface board
•INPUT-B	•Input from RGB IN
•SW'ER x-y (switcher x = 1-2, y = 1-8)	•Input from optional switcher
•POSITION No. x (VPH-1251QM: x = 1-9, VPH-1271QM: x = 1-21)	•The cursor position in ZONE adjustment

D PAGE

Subtitle	
•USER PRESET	•User preset
•USER CONTROL	•User control
•SYSTEM PRESET	•System preset
•INPUT INFO (INPUT INFORMATION)	•Input information
•OTHER ITEMS	•Other items
PAGE 1	
•STATUS ON/OFF	•On-screen display on/off
•PIC MUTE ON/OFF	•Picture mute mode on/off
•AUDIO MUTE ON/OFF	•Audio mute mode on/off
•CLEAR BLUE ON/OFF/ – – –	•Clear blue mode on/off/does not function.
•SECAM ON/OFF/ – – –	•Compulsive SECAM mode on/off/does not function.
PAGE 2	
•CONTR (CONTRAST)	•Contrast
•COLOR	•Color
•BRT (BRIGHTNESS)	•Brightness
•SHARP (SHARPNESS)	•Sharpness
•VOL	•Volume
•HUE	•Hue
•PIC CONTROL data reset	•Resets the PIC CONTROL data.
PAGE 3	
•COLOR TEMPERATURE: 9300/6500/3200/ PRESET	•Color temperature is set to 9300/6500/3200/ the data adjustable by the service personnel.
•CLAMP: AUTO / S on G/ H/C / H.P.	•Clamp position is set to automatic/internal/ external sync signal/ horizontal deflection pulse position.
•V-SHIFT: WIDE NARROW	•The adjustable range of vertical shift is wide/narrow.
PAGE 4	
•INPUT SIGNAL	•Input signal
•Y/C	•S video input signal from VIDEO IN
•RGB	•RGB input signal
•NTSC	•NTSC input signal from VIDEO IN
•PAL	•PAL input signal from VIDEO IN

•SECAM	•SECAM input signal from VIDEO IN
•B & W	•Black and white input signal from VIDEO IN
•f_H	•Horizontal frequency
•f_V	•Vertical frequency
•Internal oscillation	•Internal oscillation mode (No signal is input.)
•H/C-SYNC	•Horizontal sync signal or composite sync signal
•V-SYNC	•Vertical sync signal
•SYNC ON G	•Composite video signal
•H/C-SYNC: POS/NEG/ – – –	•The polarity of the H/C-SYNC is positive/negative/not input.
•V-SYNC: POS/NEG/ – – –	•The polarity of the V-SYNC is positive/negative/not input.
•SYNC ON G: NEG/ – – –	•The polarity of the SYNC ON G is negative/not input.
•REGI BLOCK: No. x	•The input signal is grouped into the registration memory block No. x.
PAGE 5	
•1. CRT TIMER DISPLAY	•CRT use time display
•2. BAUD RATE PRESET	•Baud rate setting display
PAGE 5-1	
•CRT TIMER DISPLAY MODE	•CRT use time display mode
RED: xxxx hours	•Red CRT use time: xxxx hours
GREEN: xxxx hours	•Green CRT use time: xxxx hours
BLUE: xxxx hours	•Blue CRT use time: xxxx hours
•CRT TIMER RESET MODE	•CRT use time reset mode
RED: xxxx hours	•Red CRT use time: xxxx hours
GREEN: xxxx hours	•Green CRT use time: xxxx hours
BLUE: xxxx hours	•Blue CRT use time: xxxx hours
PAGE 5-2	
•RS422 COMMUNICATION BAUD RATE PRESET MODE 38.4K/19.2K/9600/4800	•The baud rate is set to 38.4K/19.2K/9600/4800 when communicating via the RS-422.

E Operation

•YES: ▲	•Press ▲ key for "Yes".
•NO: ▼	•Press ▼ key for "No".
•SELECT: ◀ ▶	•Press ◀ or ▶ key to select.
•SELECT: ◀ ▶ ▲ ▼	•Press, ◀, ▶, ▲ or ▼ key to select.
•ADJ: ◀ ▶ ▲ ▼	•Press ◀, ▶, ▲ or ▼ key to adjust.
•ADJ: ◀ ▶	•Press ◀ or ▶ key to adjust.
•ADJ: ▲ ▼	•Press ▲ or ▼ key to adjust.
•NEXT: ⊞ ⊟	•Press ⊞ key to move the cursor to the next position. Press ⊟ key to move the cursor to the previous position.
•NEXT: [PAGE]	•Press PAGE key to go to the next page.
•EXIT: [PAGE]	•Press PAGE key to exit the PAGE mode.
•EXIT: [NORMAL]	•Press NORMAL key to exit the TEST mode.
•ENTER: ▶	•Press ▶ key to execute the selected item.
•TIMER RESET MODE ◀▶ simultaneously	•Press ◀ and ▶ keys simultaneously to enter the CRT use time reset mode.
•COLOR SELECT: ▲▼	•Press ▲ or ▼ key to select color.
•TIMER RESET: ◀	•Press ◀ key to set the CRT use time to 0000.
•ENTER: [MEMORY]	•Press MEMORY key to save the reset conditions.

F Memory data

•MEMORY DATA in saving.	•Saving the memory data now.
•MEMORY DATA saving is complete!	•Saving the memory data is completed.
•No key may be applicable during the indication of this mode.	•When in this mode (MEMORY DATA saving), no key functions.
•The registration data will be used as standard for all inputs OK?	•Is it all right that this registration data will be used as standard for all inputs?

G Data reset

•Do you wish to return to factory preset data?	•Do you wish to reset the data to the factory preset data?
•Do you wish to return to previously saved data?	•Do you wish to reset the data to the previously saved data?
•Reset complete!	•Resetting is completed.
•RGB SIZE DATA RESET MODE	•RGB or video input size data resetting mode
•RGB SHIFT DATA RESET MODE	•RGB input shift data resetting mode
•BLANKING DATA RESET MODE	•Blanking data resetting mode
•CENTERING ALL COLOR DATA RESET MODE	•Centering data (all color) resetting mode
•W/B GAIN & BIAS ALL COLOR DATA RESET MODE	•Gain, bias (all color) data resetting mode
•REGISTRATION (RED/GREEN/BLUE) DATA RESET MODE	•Registration (red, green or blue) data resetting mode

H Raster

•RASTER R G B	•Red, green and blue are projected.
•RASTER R - -	•Only red is projected.
•RASTER - G -	•Only green is projected.
•RASTER - - B	•Only blue is projected.
•RASTER R G -	•Red and green are projected.
•RASTER R - B	•Red and blue are projected.
•RASTER - G B	•Green and blue are projected.

I Adjustment

•RGB SIZE ADJ	•RGB or video input size adjustment mode
•RGB SHIFT ADJ	•RGB input shift adjustment mode
•R CENT ADJ	•Red centering adjustment mode
•G CENT ADJ	•Green centering adjustment mode
•B CENT ADJ	•Blue centering adjustment mode
•SIZE ADJ	•Size adjustment mode
•fine	•Picture size fine-adjustment mode for green.
•LIN (LINEARITY) ADJ	•Linearity adjustment mode
•SKEW ADJ	•Skew adjustment mode
•BOW ADJ	•Bow adjustment mode
•KEY (KEYSTONE) ADJ	•Keystone adjustment mode
•PIN (PINCUSHION) ADJ	•Pincushion adjustment mode
•ZONE ADJ	•Zone adjustment mode
•BLKG ADJ UPPER/LOWER/LEFT/RIGHT	•Blanking adjustment (upper, lower, left, or right) mode
•BIAS ADJ	•White balance bias adjustment mode
•GAIN ADJ	•White balance gain adjustment mode

J Adjustment data

•H: xxx	•Horizontal adjustment level (xxx = 0-255)
•V: xxx	•Vertical adjustment level (xxx = 0-255)
•Hf: xxx	•Centering adjustment level for horizontal direction (xxx = 0-255) The level changes with the arrow keys pressed once.
•Hc: xxx	•Centering adjustment level for horizontal direction (xxx = 0-255) The level changes with the arrow keys kept pressed.
•Vf: xxx	•Centering adjustment level for vertical direction (xxx = 0-255) The level changes with the arrow keys pressed once.
•Vc: xxx	•Centereing adjustment level for vertical direction (xxx = 0-255) The level changes with the arrow keys kept pressed.

K Caution, Message (VPH-1251QM only)

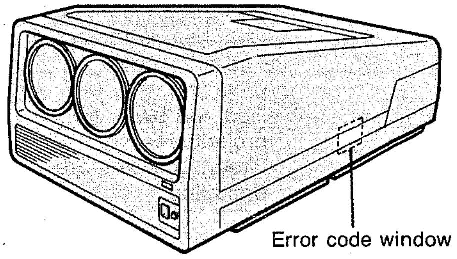
•fH is too high! This input signal cannot be projected as the horizontal frequency is too high.	•The horizontal frequency is too high. This input signal cannot be projected as the horizontal frequency exeeds the acceptable level of the projector.

L Others

•For optimum performance, white screen will remain for 20 min. For immediate use, push [PAGE] key.	•For optimum performance, white screen will remain for 20 min. For immediate use, push PAGE key.
•INITIALIZATION TIME SETTING	•Initialization time setting mode.
•You can change the white screen display time.	•You can change the white screen display time.
Standard 20 min ... xx min	The factory preset time is 20 min. The current preset time is xx min.
•Do you wish to enter into the SERVICEMAN CONTROL MODE?	•Do you wish to enter into the service-personnel control mode?
•Do you wish to return to the USER CONTROL MODE?	•Do you wish to return to the user control mode?

About the Error Codes

When an opreational error occurs, the power will automatically turn off, and the error code will light up near the chassis inside the hood. Refer to the chart below for the meanings.



Y: Error occurrence

error / Code	FAN stop	(H stop) 100V down	IK-over	V-stop	HV-over	power-down
01	Y	—	—	—	—	—
02	—	Y	—	—	—	—
03	Y	Y	—	—	—	—
04	—	—	Y	—	—	—
05	Y	—	Y	—	—	—
06	—	Y	Y	—	—	—
07	Y	Y	Y	—	—	—
08	—	—	—	Y	—	—
09	Y	—	—	Y	—	—
0A	—	Y	—	Y	—	—
0b	Y	Y	—	Y	—	—
0C	—	—	Y	Y	—	—
0d	Y	—	Y	Y	—	—
0E	—	Y	Y	Y	—	—
0_	Y	Y	Y	Y	—	—
10	—	—	—	—	Y	—
11	Y	—	—	—	Y	—
12	—	Y	—	—	Y	—
13	Y	Y	—	—	Y	—
14	—	—	Y	—	Y	—
15	Y	—	Y	—	Y	—
16	—	Y	Y	—	Y	—
17	Y	Y	Y	—	Y	—
18	—	—	—	Y	Y	—
19	Y	—	—	Y	Y	—
1A	—	Y	—	Y	Y	—
1b	Y	Y	—	Y	Y	—
1C	—	—	Y	Y	Y	—
1d	Y	—	Y	Y	Y	—
1E	—	Y	Y	Y	Y	—
1_	Y	Y	Y	Y	Y	—
20	—	—	—	—	—	Y

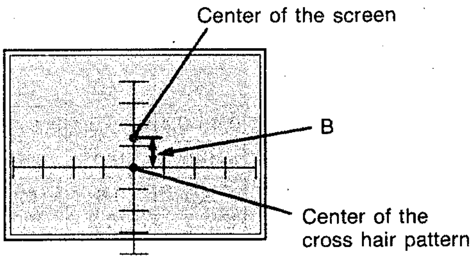
Notes

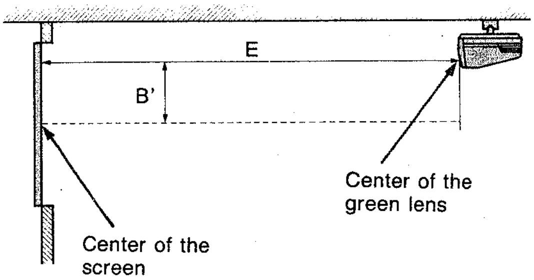
- When the error code lights up, all the previous adjustment data will be cleared.
- The error code will disappear when the MAIN POWER switch is turned off and the power cord is disconnected.
- The error code will light up every time the power is turned on unless the operational error is recovered to normal.

1-24. LIST OF WASHERS USED FOR NON-STANDARD INSTALLATION

A: Thickness of washer (mm)
B:

B'/E:



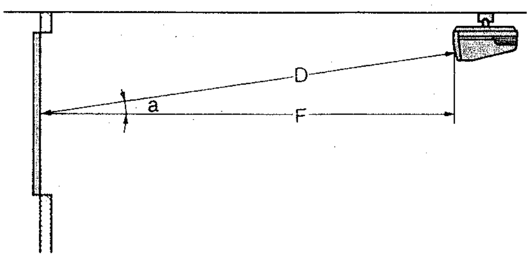


Angle of optical axis (°)	Screen size (inches) / B'/E		70	72	75	80	85	86	90	95	100	105	110	115
1	0.0087 – 0.0262	A	1+1.2	1+1.2	1+1.2	1+1.2	1+1.2	1+0.5	1+0.5	1+0.5	1+0.5	1+0.5	1+0.5	1+0.5
		B	60	60	60	65	70	70	75	80	80	85	90	95
2	0.0263 – 0.0437	A	1+1	1+1	1+1	1+1	1+1	1.2	1.2	1+0.4	1+0.4	1+0.4	1+0.4	1+0.4
		B	50	60	60	65	70	70	75	80	80	85	90	95
3	0.0438 – 0.0612	A	1.2+0.5	1.2+0.5	1.2+0.5	1.2+0.5	1.2+0.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		B	55	55	60	65	70	70	70	75	80	85	90	95
4	0.0613 – 0.0787	A	1.2+0.4	1.2+0.5	1.2+0.5	1.2+0.5	1.2+0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		B	55	55	60	65	70	70	70	75	80	85	90	90
5	0.0788 – 0.0963	A	1+0.5	1+0.5	1+0.5	1.2+0.4	1.2+0.4	0.4+0.5	0.4+0.5	0.4+0.5	1.0	1.0	1.0	1.0
		B	55	55	60	65	70	70	70	75	80	85	90	90
6	0.0964 – 0.1139	A	1.2	1.2	1.2	1+0.4	1+0.4	0.5	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.5	0.4+0.5	0.4+0.5
		B	50	50	55	60	65	60	65	65	70	75	80	80
7	0.1140 – 0.1317	A	1.0	1.0	1.2	1.2	1.2	0.5	0.5	0.5	0.5	0.4+0.4	0.4+0.4	0.4+0.4
		B	45	45	50	50	55	55	55	60	60	65	70	70
8	0.1318 – 0.1495	A	0.4+0.5	1.0	1.0	1.0	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		B	40	40	40	45	50	45	45	50	50	55	60	60
9	0.1496 – 0.1673	A	0.4+0.4	0.4+0.4	0.4+0.5	1.0	1.0	0.4	0.4	0.4	0.5	0.5	0.5	0.5
		B	35	35	35	40	40	35	40	40	45	45	50	50
10	0.1674 – 0.1853	A	0.5	0.5	0.5	0.4+0.4	0.4+0.5	—	—	0.4	0.4	0.4	0.5	0.5
		B	25	30	30	30	35	30	30	35	35	40	40	40
11	0.1854 – 0.2035	A	0.4	0.5	0.5	0.5	0.4+0.4	—	—	—	—	0.4	0.4	0.4
		B	20	20	25	25	25	20	25	25	25	30	30	30
12	0.2036 – 0.2217	A	—	0.4	0.4	0.5	0.5	—	—	—	—	—	—	0.4
		B	15	15	15	20	20	14	14	15	20	20	20	20
13	0.2218 – 0.2401	A	—	—	—	0.4	0.5	—	—	—	—	—	—	—
		B	10	10	10	10	10	5	5	5	10	10	10	10
14	0.2402 – 0.2493	A	—	—	—	—	0.4	0.4	—	—	—	—	—	—
		B	5	5	5	5	5	0	0	0	0	0	0	0

Angle of optical axis (°)	Screen size (inches) B'/E		120	125	130	135	139	140	150	160	170	180	190	200
1	0.0087 – 0.0262	A	1+0.5	1+0.5	1+0.5	1+0.5	1+0.5	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4
		B	100	105	110	110	115	115	120	130	140	150	155	165
2	0.0263 – 0.0437	A	1+0.4	1+0.4	1+0.4	1+0.4	1+0.4	0.5	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4
		B	100	105	105	110	115	115	120	130	140	150	155	165
3	0.0438 – 0.0612	A	1.2	1.2	1.2	1.2	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		B	95	100	105	110	115	110	120	130	135	145	155	160
4	0.0613 – 0.0787	A	1.2	1.2	1.2	1.2	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		B	95	100	105	110	110	110	120	130	135	145	155	160
5	0.0788 – 0.0963	A	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		B	95	100	105	110	115	110	115	125	130	140	150	155
6	0.0964 – 0.1139	A	0.4+0.5	1.0	1.0	1.0	1.0	0.4	0.4	0.4	0.5	0.5	0.5	0.5
		B	85	90	95	100	100	95	100	110	115	125	130	140
7	0.1140 – 0.1317	A	0.4+0.4	0.4+0.5	0.4+0.5	0.4+0.5	0.4+0.5	—	0.4	0.4	0.4	0.4	0.4	0.5
		B	75	80	80	85	90	85	90	95	100	110	115	120
8	0.1318 – 0.1495	A	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.4	0.4+0.5	—	—	—	0.4	0.4	0.4	0.4
		B	65	65	70	75	75	70	75	80	85	90	95	100
9	0.1496 – 0.1673	A	0.5	0.5	0.5	0.4+0.4	0.4+0.4	—	—	—	—	—	0.4	0.4
		B	55	55	60	60	65	55	60	65	70	75	80	85
10	0.1674 – 0.1853	A	0.5	0.5	0.5	0.5	0.5	—	—	—	—	—	—	—
		B	45	45	50	50	55	40	45	50	55	55	60	65
11	0.1854 – 0.2035	A	0.5	0.5	0.5	0.5	0.5	—	—	—	—	—	—	—
		B	35	35	35	40	40	30	30	35	40	40	45	45
12	0.2036 – 0.2217	A	0.4	0.4	0.5	0.5	0.5	—	—	—	—	—	—	—
		B	20	25	25	25	25	15	20	20	20	25	25	30
13	0.2218 – 0.2401	A	—	0.4	0.4	0.4	0.4	—	—	—	—	—	—	—
		B	10	10	15	15	15	5	5	5	5	10	10	10
14	0.2402 – 0.2493	A	—	—	—	0.4	0.4	—	—	—	—	—	—	—
		B	0	0	0	5	5	0	0	5	5	5	5	5

Angle of optical axis (°)	Screen size (inches) B'/E		210	220	230	240	250	260	270	280	290	300
1	0.0087 – 0.0262	A	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.5	0.4 + 0.5
		B	175	180	190	200	205	215	225	235	240	250
2	0.0263 – 0.0437	A	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4
		B	175	180	190	200	210	215	225	235	245	250
3	0.0438 – 0.0612	A	0.5	0.5	0.5	0.5	0.5	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4
		B	170	180	185	195	205	215	225	235	245	250
4	0.0613 – 0.0787	A	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4 + 0.4	0.4 + 0.4	0.4 + 0.4
		B	170	180	185	195	205	215	220	230	240	245
5	0.0788 – 0.0963	A	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
		B	165	170	180	190	195	205	215	220	230	235
6	0.0964 – 0.1139	A	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5
		B	145	155	160	165	175	185	190	200	205	210
7	0.1140 – 0.1317	A	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
		B	125	135	140	145	155	160	165	170	180	185
8	0.1318 – 0.1495	A	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
		B	110	115	120	125	130	135	141	145	150	160
9	0.1496 – 0.1673	A	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
		B	90	95	100	105	110	115	115	120	125	130
10	0.1674 – 0.1853	A	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
		B	70	70	75	80	80	20	20	20	20	20
11	0.1854 – 0.2035	A	—	—	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
		B	50	50	55	55	60	10	10	15	15	15
12	0.2036 – 0.2217	A	—	—	—	—	0.4	0.4	0.4	0.4	0.4	0.4
		B	30	30	35	35	40	10	10	15	15	15
13	0.2218 – 0.2401	A	—	—	—	—	—	—	0.4	0.4	0.4	0.4
		B	10	15	15	15	15	10	10	15	15	15
14	0.2402 – 0.2493	A	—	—	—	—	—	—	—	—	—	—
		B	5	10	10	10	10	0	0	0	0	0

1-25. PROJECTION DISTANCE BY ANGLE OF OPTICAL AXIS



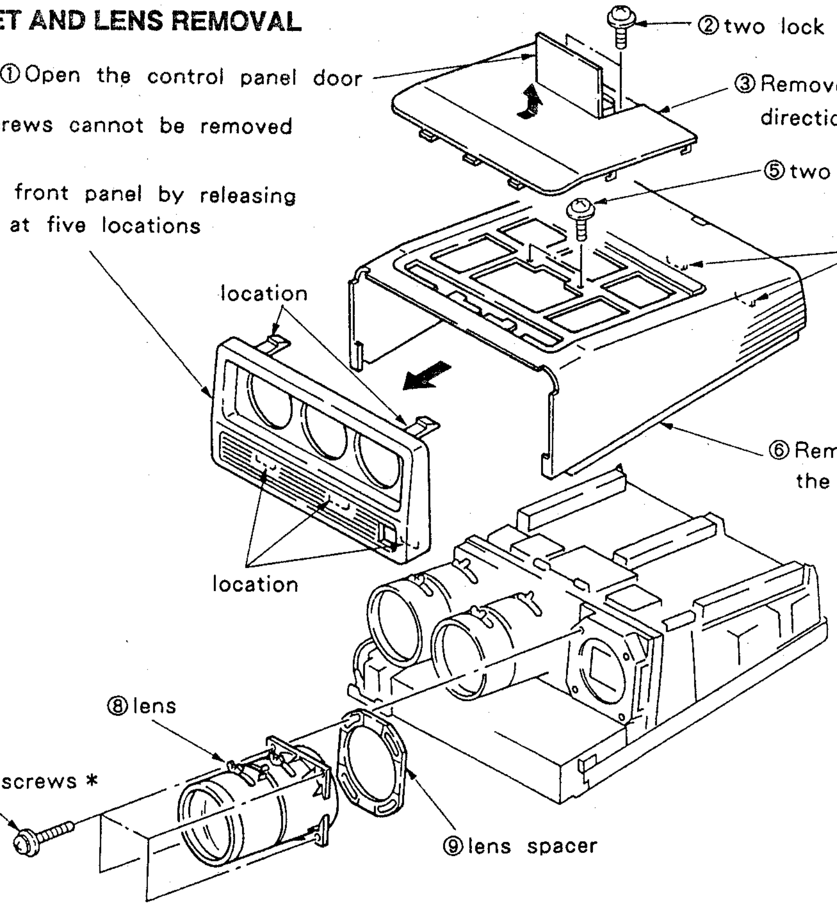
Screen size (inches)	a = 1°		a = 2°		a = 3°		a = 4°		a = 5°		a = 6°	
	D (mm)	F (mm)	D (mm)	F (mm)	D (mm)	F (mm)	D (mm)	F (mm)	D (mm)	F (mm)	D (mm)	F (mm)
70	2038	2037	2038	2037	2039	2036	2039	2035	2040	2032	2041	2030
72	2091	2091	2092	2090	2168	2089	2093	2088	2093	2085	2094	2083
75	2170	2170	2171	2169	2171	2168	2172	2167	2173	2164	2174	2162
80	2302	2302	2303	2301	2303	2300	2304	2299	2313	2304	2316	2303
85	2437	2437	2435	2433	2444	2440	2454	2448	2464	2454	2467	2454
86	2461	2460	2461	2460	2462	2458	2463	2457	2470	2460	2476	2462
90	2566	2566	2567	2565	2568	2564	2568	2562	2569	2559	2570	2556
95	2698	2698	2698	2697	2700	2696	2700	2694	2701	2690	2703	2688
100	2830	2830	2831	2829	2832	2828	2832	2826	2833	2822	2835	2819
105	2963	2962	2964	2962	2965	2960	2965	2958	2966	2954	2968	2952
110	3096	3095	3097	3095	3098	3093	3098	3091	3099	3087	3101	3084
115	3224	3223	3225	3223	3225	3221	3226	3219	3227	3214	3229	3211
120	3352	3351	3352	3350	3353	3349	3354	3346	3355	3342	3357	3339
125	3484	3483	3484	3482	3458	3454	3486	3478	3487	3473	3489	3470
130	3616	3615	3616	3614	3617	3612	3619	3610	3629	3615	3630	3610
135	3748	3747	3749	3746	3751	3744	3753	3744	3773	3758	3773	3753
139	3853	3852	3854	3852	3855	3850	3868	3858	3887	3871	3888	3866
140	3880	3879	3881	3878	3882	3876	3888	3879	3901	3885	3905	3883
145	4012	4011	4013	4010	4014	4008	4015	4005	4022	4006	4027	4005
150	4144	4143	4145	4142	4146	4140	4147	4137	4149	4132	4151	4128
155	4275	4274	4276	4274	4277	4271	4279	4268	4280	4263	4283	4259
160	4406	4405	4407	4405	4409	4403	4410	4399	4412	4394	4414	4390
165	4538	4537	4539	4536	4540	4534	4541	4531	4543	4525	4546	4521
170	4669	4668	4670	4667	4672	4665	4673	4662	4675	4656	4677	4652
175	4800	4799	4802	4799	4803	4796	4804	4793	4806	4787	4809	4782
180	4932	4931	4933	4930	4934	4927	4936	4924	4937	4918	4940	4913
185	5063	5062	5064	5061	5066	5059	5067	5055	5069	5049	5072	5044
190	5194	5193	5196	5193	5197	5190	5199	5186	5200	5180	5203	5175
195	5326	5325	5327	5324	5329	5321	5330	5317	5332	5311	5335	5306
200	5457	5456	5458	5455	5460	5452	5462	5448	5463	5442	5467	5437
205	5590	5589	5592	5588	5593	5585	5595	5581	5597	5574	5600	5569
210	5723	5722	5725	5721	5726	5718	5728	5714	5730	5707	5733	5702
215	5856	5855	5858	5854	5860	5851	5861	5847	5863	5840	5867	5834
220	5990	5988	5991	5988	5993	5984	5995	5980	5997	5973	6000	5967
225	6123	6121	6124	6121	6126	6117	6128	6113	6130	6105	6133	6100
230	6256	6255	6257	6254	6259	6251	6261	6246	6263	6238	6267	6232
235	6389	6388	6391	6387	6392	6384	6394	6379	6397	6371	6400	6365
240	6522	6521	6524	6520	6526	6517	6528	6512	6530	6504	6534	6498
245	6655	6654	6657	6653	6659	6650	6661	6645	6663	6636	6667	6630
250	6788	6787	6790	6786	6792	6783	6794	6778	6796	6769	6800	6763
260	7055	7053	7057	7053	7058	7048	7061	7044	7063	7036	7067	7028
270	7321	7320	7323	7319	7325	7315	7327	7309	7330	7302	7334	7293
280	7587	7586	7589	7584	7591	7581	7594	7576	7596	7567	7601	7559
290	7853	7852	7856	7851	7858	7847	7860	7841	7863	7833	7867	7824
300	—	—	—	—	—	—	—	—	8130	8099	8134	8089

Screen size (inches)	a = 7°		a = 8°		a = 9°		a = 10°		a = 11°		a = 12°	
	D (mm)	**F** (mm)	**D** (mm)	**F** (mm)	**D** (mm)	**F** (mm)	**D** (mm)	**F** (mm)	**D** (mm)	**F** (mm)	**D** (mm)	**F** (mm)
70	2042	2027	2044	2024	2045	2020	2047	2016	2049	2012	2051	2006
72	2096	2080	2097	2077	2099	2073	2101	2069	2103	2064	2105	2059
75	2175	2159	2177	2155	2178	2152	2180	2147	2182	2142	2185	2137
80	2317	2300	2319	2296	2319	2291	2320	2285	2322	2279	2323	2272
85	2469	2451	2471	2447	2471	2441	2472	2435	2473	2428	2476	2421
86	2478	2459	2479	2455	2483	2452	2488	2450	2491	2445	2492	2438
90	2572	2553	2574	2549	2576	2545	2582	2542	2584	2537	2586	2529
95	2704	2684	2707	2680	2709	2675	2711	2670	2714	2664	2718	2658
100	2837	2815	2839	2811	2841	2806	2844	2801	2847	2795	2851	2788
105	2970	2948	2972	2943	2975	2938	2978	2932	2981	2926	2984	2919
110	3103	3080	3106	3075	3108	3070	3111	3064	3114	3057	3118	3050
115	3231	3207	3234	3202	3236	3197	3240	3190	3243	3183	3247	3175
120	3359	3334	3362	3329	3365	3323	3368	3317	3372	3309	3376	3301
125	3492	3465	3494	3460	3497	3454	3501	3447	3504	3440	3509	3431
130	3632	3605	3632	3597	3637	3592	3639	3584	3640	3573	3642	3561
135	3776	3748	3776	3739	3779	3733	3783	3725	3785	3716	3784	3701
139	3890	3861	3890	3853	3894	3846	3899	3839	3900	3828	3901	3815
140	3913	3884	3915	3877	3920	3871	3921	3861	3925	3853	3929	3842
145	4030	4000	4037	3998	4041	3991	4042	3981	4047	3973	4051	3961
150	4154	4123	4159	4118	4162	4111	4165	4102	4170	4093	4175	4083
155	4285	4253	4289	4247	4293	4240	4297	4232	4302	4223	4307	4212
160	4417	4384	4421	4378	4425	4370	4429	4362	4434	4353	4440	4342
165	4549	4515	4552	4508	4557	4500	4561	4492	4567	4482	4572	4472
170	4680	4645	4684	4639	4688	4631	4693	4622	4699	4612	4704	4601
175	4812	4776	4816	4769	4820	4761	4825	4752	4831	4742	4837	4730
180	4944	4907	4948	4900	4952	4891	4957	4882	4963	4872	4969	4860
185	5075	5037	5079	5030	5084	5021	5090	5012	5095	5001	5101	4989
190	5207	5168	5211	5161	5216	5152	5222	5142	5227	5131	5234	5119
195	5339	5299	5343	5291	5348	5282	5354	5272	5360	5261	5366	5248
200	5470	5429	5475	5422	5480	5412	5486	5402	5492	5391	5498	5377
205	5604	5562	5608	5554	5613	5544	5619	5534	5626	5522	5633	5509
210	5737	5694	5748	5692	5747	5676	5753	5666	5760	5654	5767	5640
215	5871	5827	5875	5818	5881	5808	5887	5798	5894	5785	5901	5771
220	6004	5959	6009	5951	6014	5940	6021	5929	6028	5917	6035	5902
225	6138	6092	6143	6083	6148	6073	6155	6061	6162	6048	6169	6033
230	6271	6224	6276	6215	6282	6205	6289	6193	6296	6180	6303	6165
235	6405	6357	6410	6348	6416	6337	6422	6325	6430	6311	6437	6296
240	6538	6489	6543	6480	6549	6469	6556	6457	6564	6443	6572	6427
245	6672	6622	6676	6612	6683	6601	6690	6588	6698	6574	6706	6558
250	6805	6754	6810	6744	6817	6733	6823	6720	6832	6706	6840	6689
260	7092	7033	7078	7009	7084	6997	7101	6993	7107	6976	7113	6958
270	7339	7299	7345	7274	7352	7261	7369	7257	7376	7240	7382	7221
280	7606	7564	7612	7538	7619	7525	7637	7521	7644	7504	7650	7483
290	7873	7830	7879	7802	7886	7789	7905	7785	7912	7767	7919	7746
300	8140	8095	8146	8067	8154	8054	8173	8049	8181	8031	8187	8008

MEMO

SECTION 2
DISASSEMBLY

2-1. CABINET AND LENS REMOVAL



①Open the control panel door

* The lock screws cannot be removed

②two lock screws *

③Remove the upper board in the direction of arrow

④Remove the front panel by releasing the catches at five locations

⑤two lock screws *

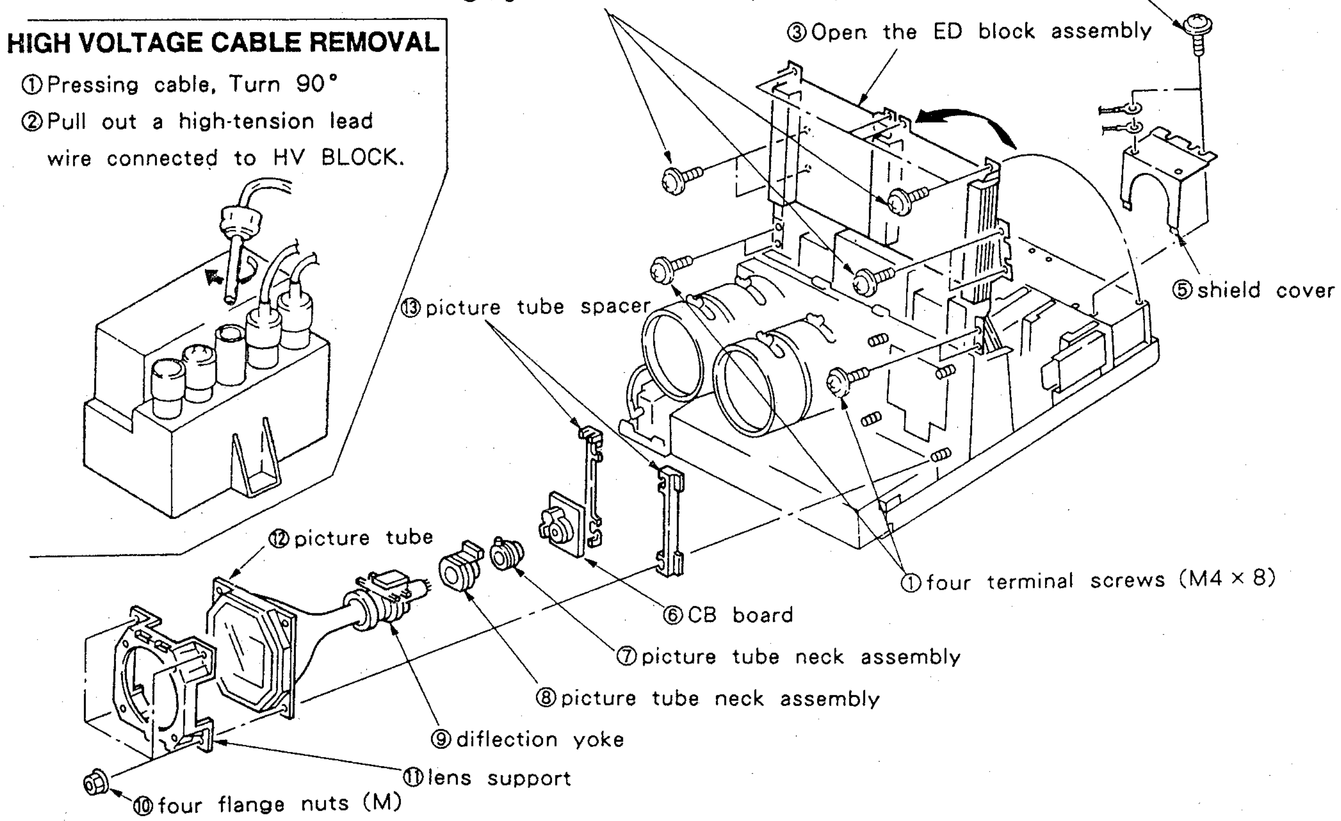
⑥Remove the hood by releasing the catches at two locations

⑦four lock screws *

⑧lens

⑨lens spacer

2-2. PICTURE TUBE REMOVAL



HIGH VOLTAGE CABLE REMOVAL

①Pressing cable, Turn 90°
②Pull out a high-tension lead wire connected to HV BLOCK.

①four terminal screws (M4 × 8)

②eight terminal screws (M3 × 8)

③Open the ED block assembly

④two terminal screws (M3 × 8)

⑤shield cover

⑥CB board

⑦picture tube neck assembly

⑧picture tube neck assembly

⑨diflection yoke

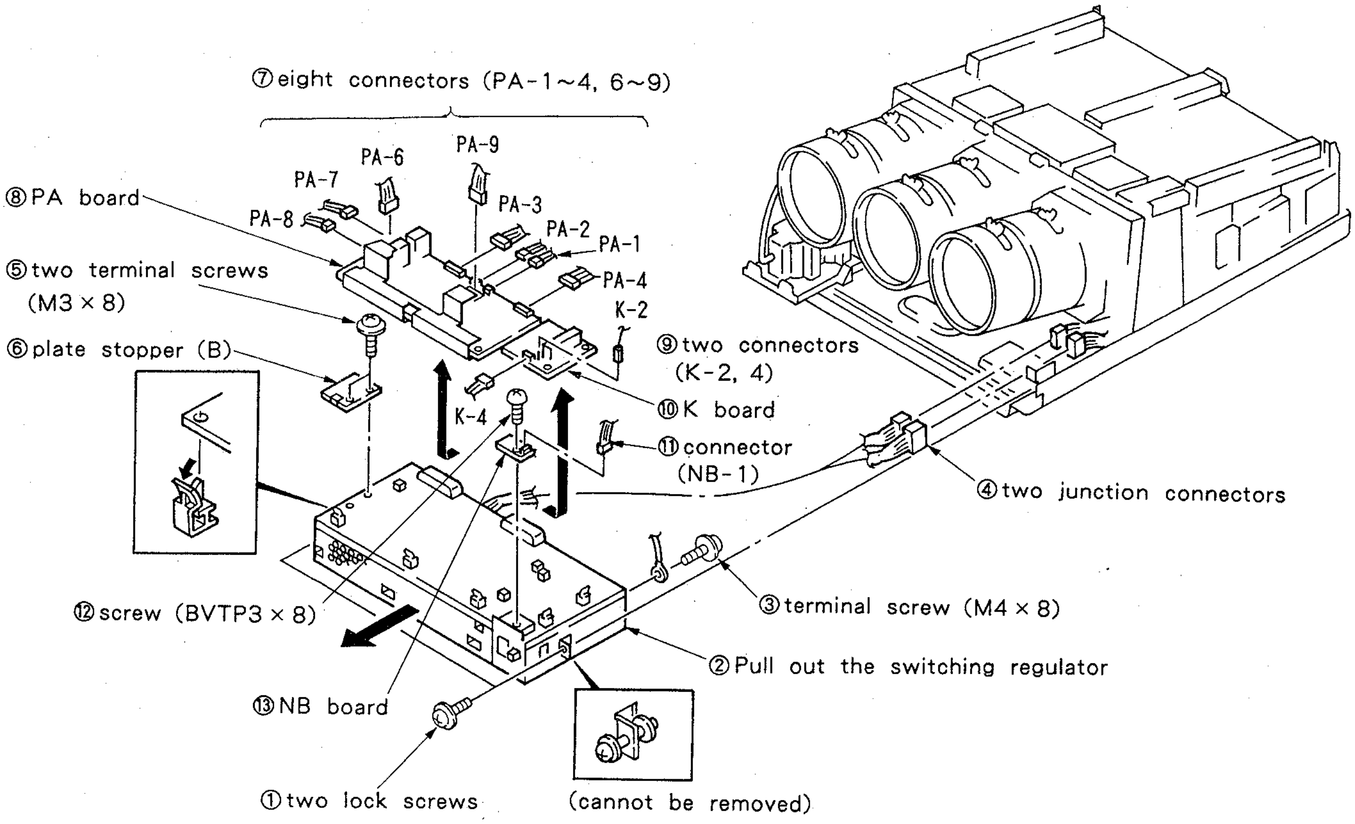
⑩four flange nuts (M)

⑪lens support

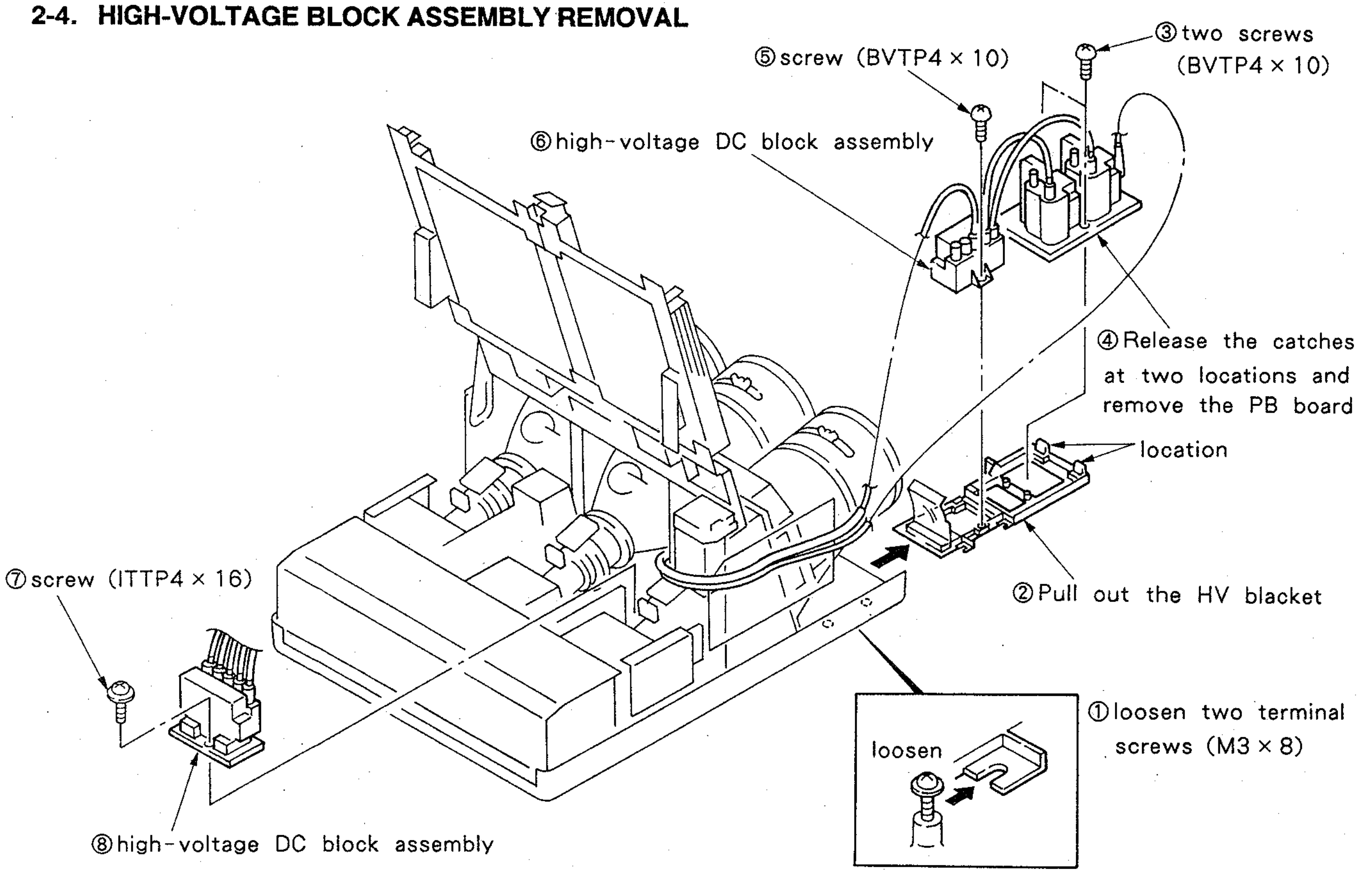
⑫picture tube

⑬picture tube spacer

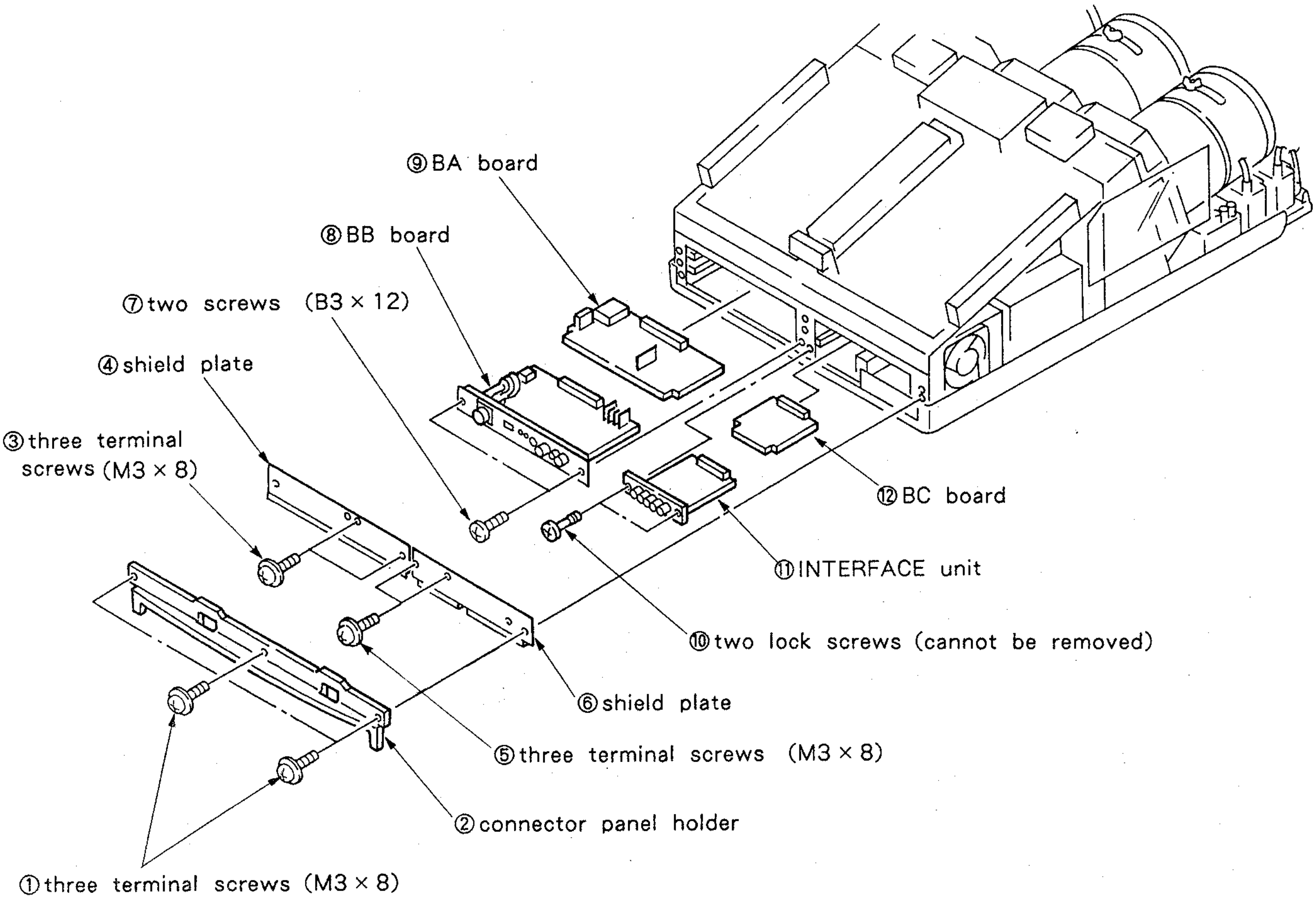
2-3. POWER BLOCK REMOVAL (PA, K AND NB BOARDS)


⑦eight connectors (PA-1~4, 6~9)
PA-9
PA-6
PA-7
⑧PA board
PA-8
PA-3
PA-2
PA-1
⑤two terminal screws
(M3 × 8)
PA-4
K-2
⑥plate stopper (B)
⑨two connectors
(K-2, 4)
K-4
⑩K board
⑪connector
(NB-1)
④two junction connectors
⑫screw (BVTP3 × 8)
③terminal screw (M4 × 8)
②Pull out the switching regulator
⑬NB board
①two lock screws
(cannot be removed)

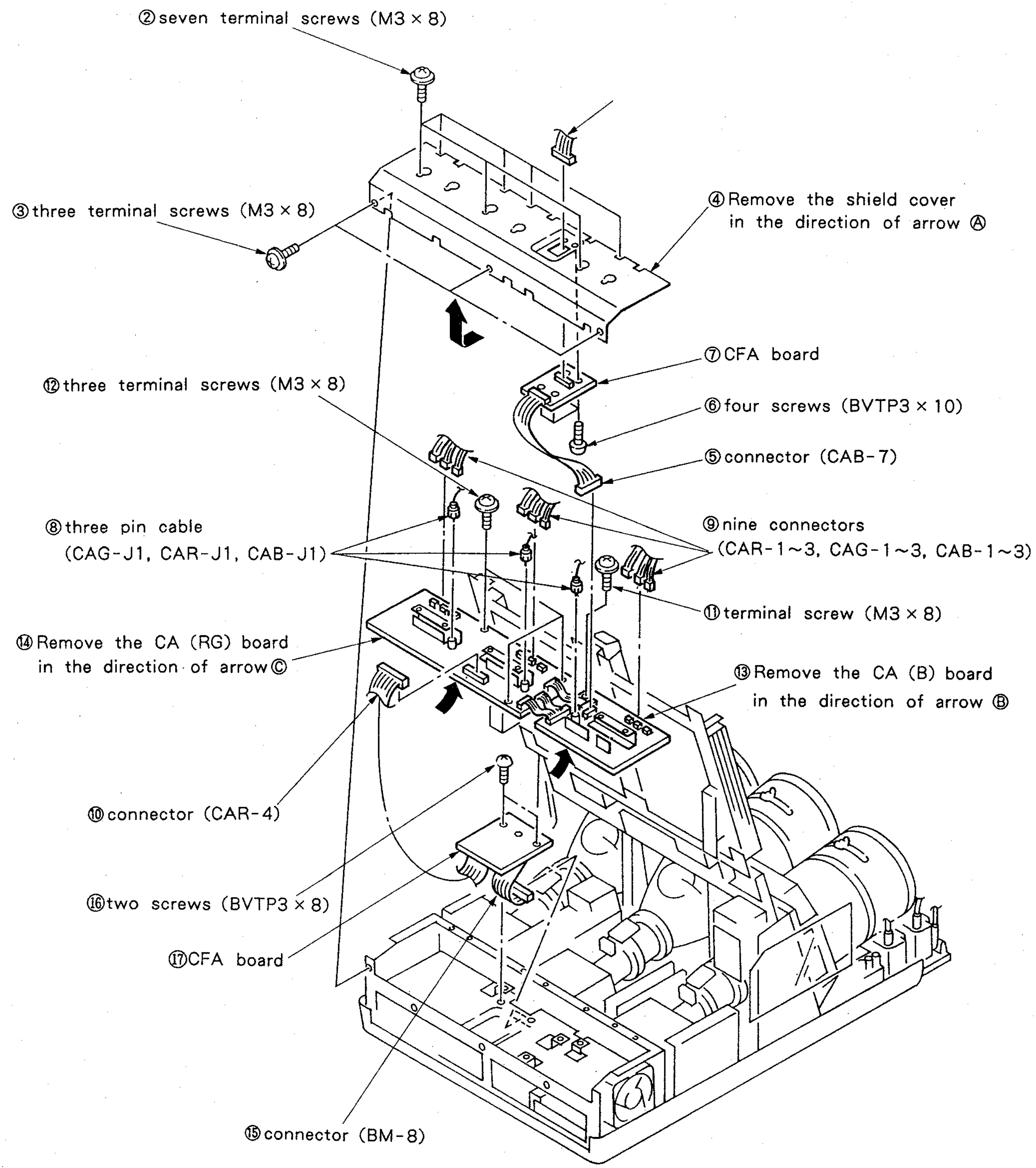
2-4. HIGH-VOLTAGE BLOCK ASSEMBLY REMOVAL


③two screws
(BVTP4 × 10)
⑤screw (BVTP4 × 10)
⑥high-voltage DC block assembly
④Release the catches
at two locations and
remove the PB board
location
⑦screw (ITTP4 × 16)
②Pull out the HV blacket
loosen
①loosen two terminal
screws (M3 × 8)
⑧high-voltage DC block assembly

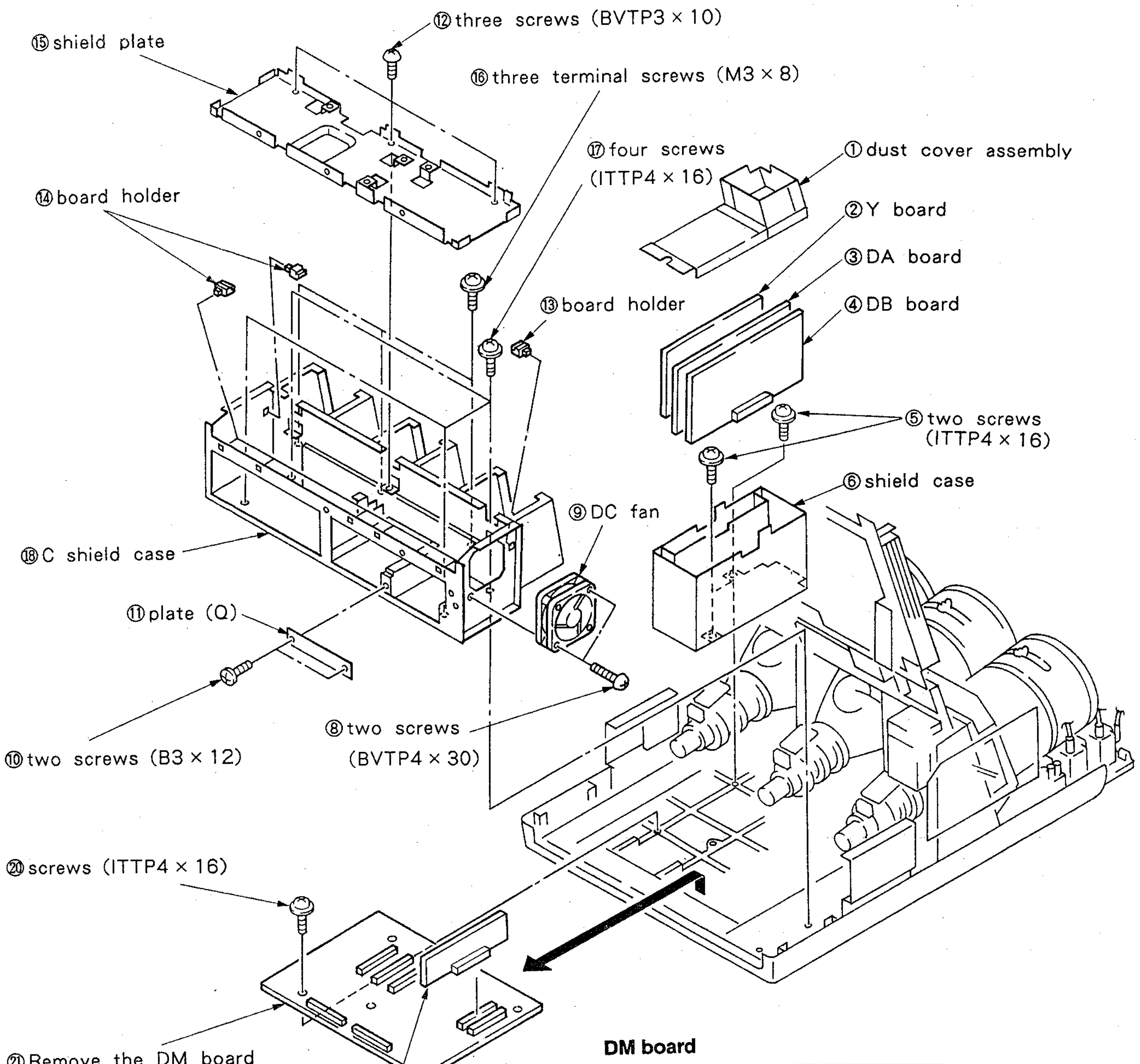
2-5. INTERFACE UNIT, BA, BC AND BB BOARDS REMOVAL


⑨BA board
⑧BB board
⑦two screws (B3 × 12)
④shield plate
③three terminal screws (M3 × 8)
⑫BC board
⑪INTERFACE unit
⑩two lock screws (cannot be removed)
⑥shield plate
⑤three terminal screws (M3 × 8)
②connector panel holder
①three terminal screws (M3 × 8)

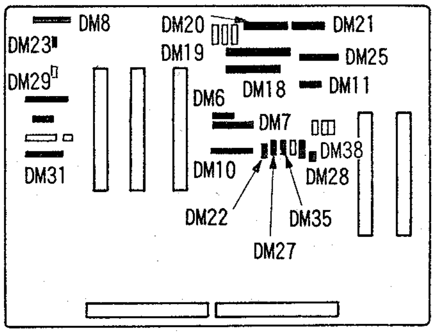
2-6. CFA, CFB, CA(RG) AND CA(B) BOARDS REMOVAL


② seven terminal screws (M3 × 8)
③ three terminal screws (M3 × 8)
④ Remove the shield cover in the direction of arrow Ⓐ
⑦ CFA board
⑫ three terminal screws (M3 × 8)
⑥ four screws (BVTP3 × 10)
⑤ connector (CAB-7)
⑧ three pin cable (CAG-J1, CAR-J1, CAB-J1)
⑨ nine connectors (CAR-1~3, CAG-1~3, CAB-1~3)
⑪ terminal screw (M3 × 8)
⑭ Remove the CA (RG) board in the direction of arrow Ⓒ
⑬ Remove the CA (B) board in the direction of arrow Ⓑ
⑩ connector (CAR-4)
⑯ two screws (BVTP3 × 8)
⑰ CFA board
⑮ connector (BM-8)

2-7. Y, DA, DB, DM AND DF BOARDS REMOVAL

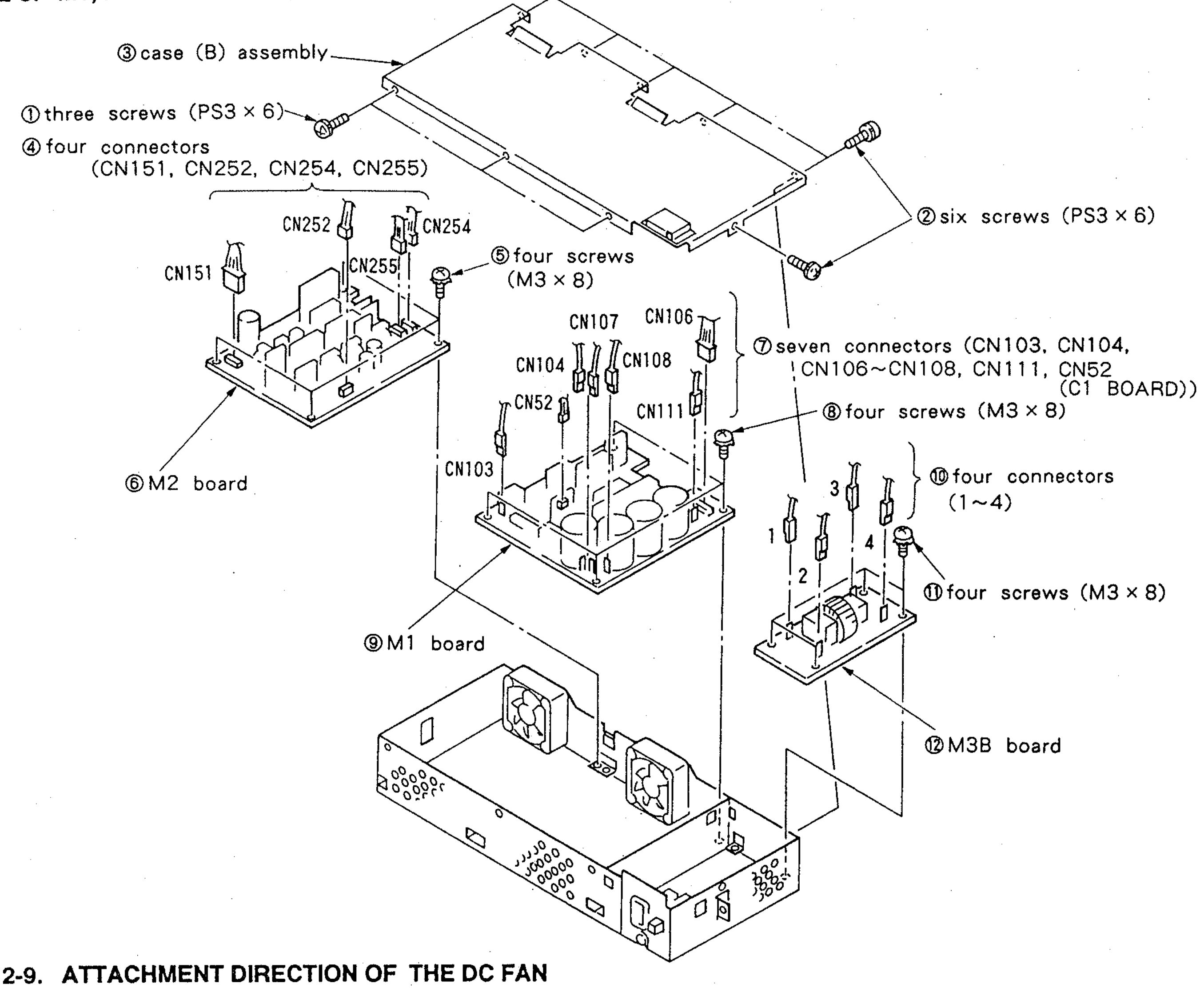

⑫three screws (BVTP3 × 10)
⑮shield plate
⑯three terminal screws (M3 × 8)
⑰four screws (ITTP4 × 16)
①dust cover assembly
⑭board holder
②Y board
③DA board
⑬board holder
④DB board
⑤two screws (ITTP4 × 16)
⑥shield case
⑨DC fan
⑱C shield case
⑪plate (Q)
⑧two screws (BVTP4 × 30)
⑩two screws (B3 × 12)
⑳screws (ITTP4 × 16)
㉑Remove the DM board in the direction of arrow
⑦DF board

DM board

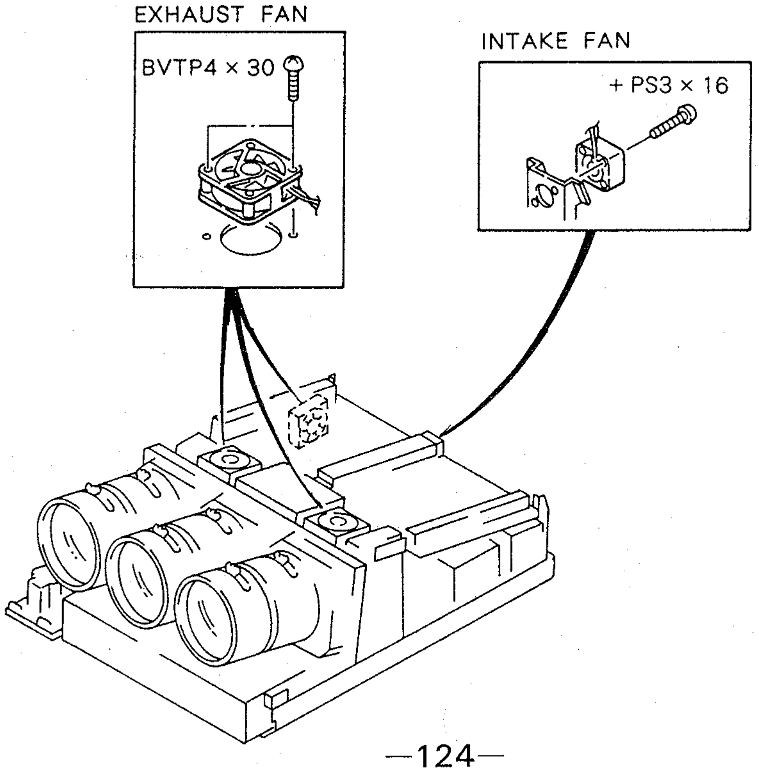

DM8
DM20
DM21
DM23
DM19
DM25
DM29
DM6
DM18
DM11
DM7
DM38
DM31
DM10
DM28
DM22
DM35
DM27

⑲nineteen connectors
(DM6~11, DM18~23, 25, DM27~29, DM31, 35, 38)

2-8. M1, M2 AND M3B BOARDS REMOVAL


③case (B) assembly
①three screws (PS3 × 6)
④four connectors
(CN151, CN252, CN254, CN255)
CN252
CN254
CN151
CN255
⑤four screws
(M3 × 8)
②six screws (PS3 × 6)
CN107
CN106
⑦seven connectors (CN103, CN104,
CN106~CN108, CN111, CN52
(C1 BOARD))
CN104
CN108
CN52
CN111
⑧four screws (M3 × 8)
CN103
⑥M2 board
3
⑩four connectors
(1~4)
1
4
2
⑪four screws (M3 × 8)
⑨M1 board
⑫M3B board

2-9. ATTACHMENT DIRECTION OF THE DC FAN


EXHAUST FAN
BVTP4 × 30
INTAKE FAN
+PS3 × 16

SECTION 3
CIRCUIT DESCRIPTIONS

3-1. CIRCUIT OPERATION OF BA BOARD

3-1-1. Y-System

1. Trap circuit

After passing Q11, video signal enters to a trap circuit. A Trap circuit eliminates chroma component from video signal. This projector model is equipped with 3 trap circuits, and switches/enables one of them because video signals of 3 different color TV system, i.e., PAL, SECAM, NTSC3.58, and NTSC 4.43, may enter to this projector model (subcarrier frequency is same both in PAL and NTSC4.43).

[Circuit operation with PAL or NTSC3.58 system]

Video signal passes a low-pass filter FL4, an amplifier (Q30 and Q31), a clamp-circuit (Q18, Q32, D10, D11), then enters to pin ① of a comb-filter IC10. IC10 operates as a comb-filter for PAL system when pin ㉞ is held High, and for NTSC3.58 system when pin ㉞ is held Low, and outputs Y-signal from pin ⑬.

Y-signal thus output from the comb-filter enters to pin 17 of IC3. IC3 gives a time-delay to Y-signal, then output it from pin ⑪. The delayed Y-signal passes an amplifier (Q118, Q119, Q120) then enters to pin ① of IC6. IC6 is the switching IC for Y-signal, and selects one from NTSC3.58/PAL, SECAM/NTSC4.43/YC, and B/W.

[Circuit operation with SECAM, NTSC4.43, or Y/C]

Video signal enters to pin ② of BPF1. BPF1 is the trap for NTSC4.43, and BPF2 is the trap for SECAM. Control to traps is done through pins ④ and ⑤ of BPF1, and traps are enabled with High state of corresponding pins.

In SECAM operation, both pins ④ and ⑤ of BPF1 are put to High to eliminate chroma components around 4.43MHz and around 4.25MHz, and Y-signal is output from pin ⑤ of BPF2.

In NTSC4.43 operation, pin ④ is put to High and pin ⑤ is put to Low to eliminate chroma components around 4.43MHz. In YC operation, both pins ④ and ⑤ are put to Low and video signal passes through traps, then is output from pin ⑤ of BPF2.

Y-signal, output from pin ⑤ of BPF2, passes a delay-line DL102 then enters to pin ③ of IC6.

[Operation with B/W signal]

B/W signal, output from Q11, passes Q52 and enters to pin ⑥ of IC6.

2. IC6 (CX-894)

This is the IC which selects one of inputs from NTSC3.58/PAL, SECAM/NTSC4.43/YC, B/W. Pin ⑧ is the signal output terminal, and pins ② and ⑥ are control terminals. Table below shows IC's operating modes and control pins' status.

operating mode	pin ②	pin ⑥
NTSC3.58/PAL	H	L
SECAM/NTSC4.43/YC	L	H
B/W	L	L

Table. 1-1.

3. IC7 (HD14053)

Y signal from pin ⑧ of IC6 enters to pin ⑫ of IC7, and Y signal in color-difference signal mode enters to pin ⑬ of IC7, respectively. Output signal switching is done using pins ⑨, ⑩ and ⑪. Input signal to pin ⑫ is output from pin ⑭ when pins ⑨, ⑩ and ⑪ are put to Low, and input signal to pin ⑬ is output from pin ⑭ when these control pins are put to High.

4. IC12 (sharpness IC)

Y signal, output from pin ⑭ of IC7, enters to pin ② of IC12, a sharpness control IC. Y-signal is given high-peaking at about 3.6MHz in VIDEO mode, and at about 6.6MHz in IDTV mode. Y-signal is output from pin ⑩ of IC12. Sharpness control terminal is pin ⑧, and the control voltage is in −2.5V to +2.5V range. Y signal, output from pin ⑩ of the IC, passes an amplifier (Q313, Q317, Q318) and enters to pin ⑦ of IC8 (CXA-1216P), a RGB matrix.

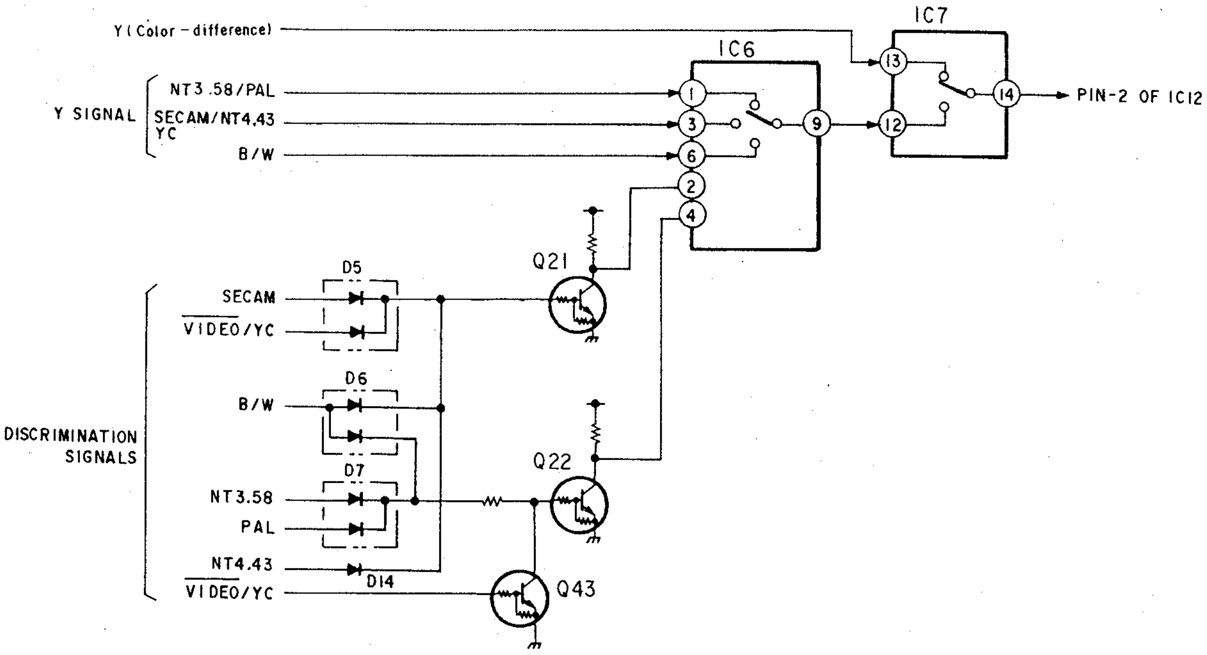

Y (Color – difference)
IC7
IC6
Y SIGNAL
NT3.58/PAL
SECAM/NT4.43
YC
B/W
1
3
6
2
4
9
13
12
14
PIN-2 OF IC12
Q21
D5
SECAM
VIDEO/YC
D6
B/W
DISCRIMINATION
SIGNALS
Q22
D7
NT3.58
PAL
NT4.43
VIDEO/YC
D14
Q43

Fig. 1-1.

3-1-2. CHROMA System

Chroma signal of NTSC3.58/PAL is output from pin ⑮ of a comb-filter (IC10). Then enters to pin ⑬ of IC1. In SECAM/NTSC4.43 or YC modes of operation, chroma signal enters to pin ⑫ or pin ① of IC1, respectively. Chroma signal is output from pin ⑮ of IC1, then passes band-pass filters as shown in Fig. 1-2.

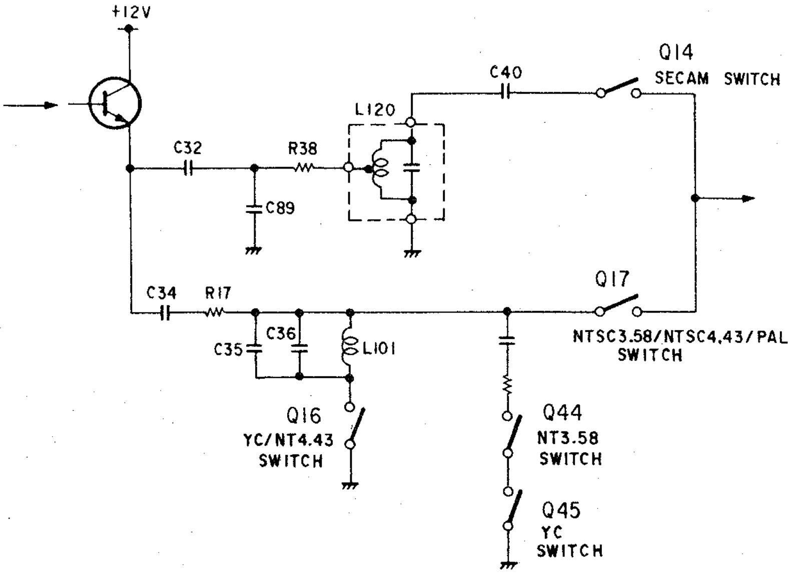

+12V
C40
Q14
SECAM SWITCH
L120
C32
R38
C89
C34
R17
C36
C35
L101
Q17
NTSC3.58/NTSC4.43/PAL
SWITCH
Q16
YC/NT4.43
SWITCH
Q44
NT3.58
SWITCH
Q45
YC
SWITCH

Fig. 1-2.

1. IC2 (TDA4555)

After passing corresponding BPFs, chroma signal enters to pin ⑮ of decoder IC (TDA4555). PAL or SECAM signal is output from pin ⑫, and it passes a delay-line to be delayed by 1H time, then enters to pin ⑩.
With its phase and level be adjusted by L105 and RV101, the signal is added to the signal entered from pin ⑮. The resultant signal is then decoded in the IC. R - Y signal is output from pin ①, and B - Y signal from pin ③.

ID circuit consists of following 3 circuits:

a. Phase discriminator to compare the phase of burst signal of PAL/NTSC system with the phase of internal reference signal
b. Frequency discriminator to provide H/2 signal in SECAM transmission an internal phase discriminator and an external phase discriminator connected to pin 22 (SECAM•ID reference circuit)
c. H/2 detector circuit for PAL/SECAM system and a logic circuit for true ID

2. HUE COL CONTROL

HUE COL CONTROL voltage is in -2.5V to 2.5V range, and is converted to 2V to 7V range in an operational amplifier (IC13), then sent to IC003 (CXA1216P) as the control voltage to it. 3 potentiometers, i.e., SUB HUE (RV105, used in NTSC system), HUE ADJ (RV103), and SUB COL (RV104) are used to compensate variation in ICs and/or resistors.

3. SUB PICTURE•SUB BRIGHT

Pin ㉗ of IC8 (CXA-1216P) is PICTURE control terminal, and pin ㉘ is BRIGHT control terminal. RV102 (SUB PIC) is used to adjust PICTURE level. Output voltage from IC9's pin ① controls SUB-BRIGHT to maintain BRIGHT level constant.

3-1-3. IC15 (H8B7178B)

IC15 performs (1) SYNC separation, and (2) Sandcastle Pulse (S.C.P.) output. Y-signal, output from pin ⑭ of IC7, passes an amplifier (Q336, Q337, Q338), a clamper (D201), a limiter (D303, D304), then enters to pin ③ of IC15. IC15's pin ① outputs S.C.P., pin ⑧ outputs V. Sync, and pin ⑪ outputs H. Sync, respectively.
S.C.P. enters to pin ㉔ of IC2 (TDA4555). Phase relationship between chroma signal (input to pin ⑮) and S.C.P. is as shown in Fig. 1-3.

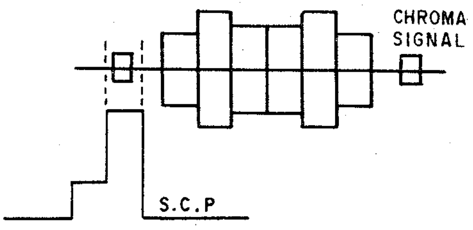


Fig. 1-3.

3-1-4. IC11 (CX-7916)

CX-7916 is an IC to discriminate 50Hz or 60Hz with H. SYNC is applied to pin ①, and V. SYNC to pin ⑤. The IC's operation is as shown in table below:

input signal	pin ②	pin ③
50Hz (PAL, SECAM)	L	H
60Hz (NTSC 3.58/4.43)	H	L

Table. 1-2.

3-1-5. B/W Discrimination

If color signal enters, one of pins ㉕ to ㉘ of IC2 is held HIGH.
This causes Q23 be turned ON, and its collector be held LOW.
Q23 does not turn ON in case of B/W signal, and its collector is held HIGH.

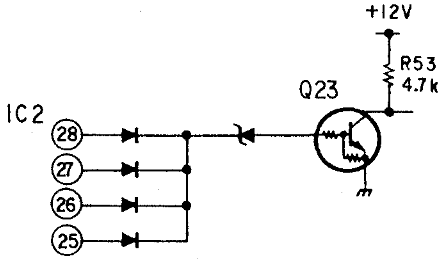


Fig. 1-4.

3-1-6. IC8 (CXA-1216P)

IC8 (CXA-1216P) is a R.G.B matrix IC. Its pin ⑦ is Y input terminal, pin ⑥ is B - Y input, pin ⑤ is R - Y input. BLK pulse enters to pin ①, and B/P. CLAMP pulse to pin ③. R, G, and B signals are output from pins ⑮, ⑰, and ⑲, respectively.
Pin ⑪ is AUTO PEDESTAL terminal, and Dynamic Pic. function is enabled when SW1 is in OPEN status.

3-1-7. IC5 (NJM2228)

IC5 generates the clock signal to be applied to pin ⑧ of comb-filter IC10.
With NTSC 3.48/PAL signal input, X101/X102 starts to oscillate. The clock signal thus generated passes Q202 and Q203, then enters to pin ① of IC5. From pin ④ of IC5, a clock signal with doubled frequency of input signal is output. It passes an amplifier (Q205, Q206, Q207), then enters to pin ⑧ of IC10.

3-1-8. IC14 (SN74LS12NS)

IC14 is a switch for IDTV discrimination. Output terminal (pin ⑫) is held HIGH during IDTV MODE or RGB MODE, and is held LOW during VIDEO MODE. This terminal controls both IC12's pin④ (control terminal of sharpness IC) and BA~1 connector's 22a (VIDEO/$\overline{\text{IDTV}}$).

Discrimination signals to be applied to IC14 are as shown below:

VIDEO/$\overline{\text{YC}}$ with Composite Video input : H
with YC input: L

RGB/$\overline{\text{Video}}$ with video input: L
with RGB input: H

Code 3 with composite video, Y/C input: H
with color difference inputs: L

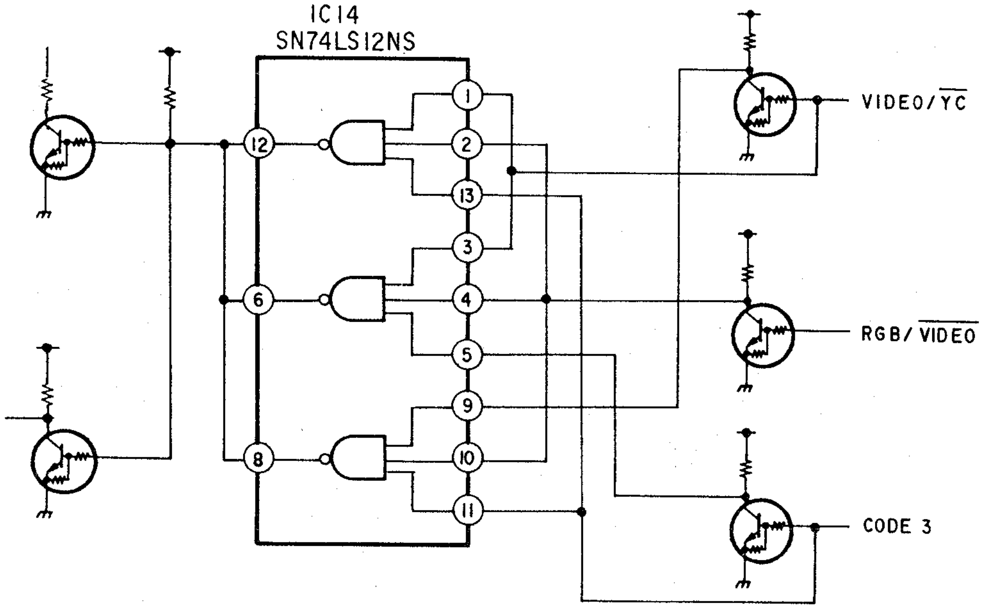

IC14
SN74LS12NS
1
2
13
3
4
5
9
10
11
12
6
8
VIDEO/$\overline{\text{YC}}$
RGB/$\overline{\text{VIDEO}}$
CODE 3

Fig. 1-5.

3-2. CIRCUIT OPERATION OF BB BOARD

3-2-1. Signal Switching Circuit

IC404, 405, 407 and the circuit around these ICs forms a signal switching circuit. It selects a video signal from (1) R.G.B. signal, (2) VIDEO signal, (3) Y/C signal, (4) color difference signal (these 4 signals enter from SLOT A, SLOT B and a switcher), and (5) VIDEO signal, (6) Y/C signal (these 2 signals enter from the panel of BB board).

1. Operation with R.G.B. Inputs (video section)

R.G.B. signals, entered to SLOT A or SLOT B, pass through BM board, then are applied to pins ⑧ of RL401, 402, 403 via pins 7a, 9a, 11a of BP-1 connector.
On the other hand, signals (entered from the switcher to BP-2 connector's pins ⑬, ⑪, ⑨ via a CCQ connector) enter to pins ⑭ of RL401, 402, 403.
Control to pin ① of each relay (RL) is done as shown in the table 2-1, and one of these two signals is output from pin ⑪. This signal is applied to transistors Q654, 710, and 757.

pin ① of RL	signal output from pin ⑪
H	pin ⑭ (CCQ)
L	pin ⑧ (SLOT A, B)

Table 2-1

Red signal passes Q651 and 653, then its pedestal level is clamped in a clamping circuit (Q650, IC410) as in case of pin ⑤ of IC410. The signal thus clamped passes a buffer (Q653), a switch (IC414) and an amplifier (IC418), then is output from pin 17b of connector BB-1.
Blue signal also passes similar circuits, and is output from pin 19b of connector BB-1.
Green signal passes "Clear Blue Circuit (see section 3-2-5)", circuits similar to Red or Blue signal, then is output from pin 18c of connector BB-1.

2. Operation with VIDEO Input (video section)

The signal, entered from VIDEO IN (panel of BB board) of the projector model, passes a resistor (R539) and a buffer (Q509), then enters to pin ⑫ of IC404.
Y-signal, entered from Y/C IN (panel of BB board), passes a buffer (Q516) then enters to pin ② of IC404. C signal passes a buffer (Q517) then enters to pin ⑤ of IC404.

Video signal, Y/C signal, and color difference signal (which enter to SLOT A and SLOT B) passes through R.G.B. signal lines via pins 7a, 9a, 11a of connector BB-1. Video signal, Y/C signal, and color difference signal (which enter to swicher) also enter to pins ⑬, ⑪ and ⑨ of connector BB-2, then enters to pins ⑭ of RL401, 402, 403. These signals are switched in accordance with the operating modes shown in the table 2-1, and is output from pin ⑪. The signals thus output pass Q506, Q507 and Q508 respectively, then enter to pins ⑬, ① and ⑬ of IC404.

IC404 selects its output signals from the signals described above and the signals entered from the panel of BB board. Thus, its pins ⑭, ⑮ and ④ output VIDEO, Y, C or R-Y, Y, R-Y, and these signals are sent to BA board via pins 5c, 4b, 5b of connector BB-1.
Table 2-2 shows the operating modes of IC404's control terminals:

V IN SEL (pin 23a of BB-1)	pins ⑨, ⑩, ⑪ of IC404	IC404's outputs (pins ⑭, ⑮, ④)
H	L	pins ⑫, ②, ⑤ (PJ main unit)
L	H	pins ⑬, ①, ③ (others)

Table 2-2

Signals, sent to BA board, are decoded and are applied to pins 8c, 9c, and 10c of BB-1 connector as R.G.B. signals. After that, each signal enters to pins ② of IC414, 415, 416, and passes through internal switching circuit, then is output from pins ⑪ of ICs. These signals pass circuits similar to in cases of R.G.B. input signals, then are output from pins 17b, 18c, 19b of connector BB-1.

3-2-2. SYNC Section

1. Operation with external SYNC

HD and VD, applied to SLOT A and SLOT B, enter to pins 1a and 2a of connector BB-1, then enter to pins ⑭ and ⑪ of IC405.

On the other hand, signals entered to switcher are applied to pins ⑦ and ⑥ of connector BB-2. After that, HD is terminated into a resistor (R501), and its peak is clamped to 0.7V by a diode (D501), then switched by transistors Q501, 502. Pulses with amplitude of 5Vp-p are output from collector of Q502, and enter to pin ⑬ of IC405.

VD also passes circuits similar to the ones in case of HD, and pulses output from the collector of Q504 enter to pin ⑩ of the IC. Operating mode of IC405 is controlled as shown in table 2-3, and signals are output from pins ⑫ and ⑨, then enter to pins ⑬ and ⑩ of IC407.

SLOT SEL (pin 23b of BB-1)	pin ① of IC405	outputs from IC405 (pins ⑫ and ⑨)
H	H	pins ⑬ and ⑩
L	L	pins ⑭ and ⑪

Table 2-3

In the case of VIDEO input, SYNC separation is done on BA board. HD is applied to pin 4a, and VD is applied to pin 5a of connector BB-1, then they enter to pins ⑭ and ⑪ of IC407, respectively. Operating mode of IC407 is controlled as shown in table 2-4, and signals output from pins ⑫ and ⑨ enter to 26c and 26a of connector BB-1.

pin ① of IC407	pins ⑫, ⑨, ⑦ of IC407
L	pins ⑭, ⑪, ⑤
H	pins ⑬, ⑩, ⑥

Table 2-4

2. Operation with SYNC on green

RL402 selects a signal from (1) GREEN signal entered from SLOT A and SLOT B, and (2) GREEN signal entered from switcher, as described in section 3-2-1 "Signal Switching Circuit". The signal thus selected is applied to pin ⑦ of IC401, then is output from pin ④.

The output signal passes through C762 and enter to IC417. It is output from pin ⑦ in negative polarity, and is MIXed with the pulses output from pin ⑫, then enters to pin ⑥ of IC407. Also, H SYNC enters to pin ⑤ of the IC in Video input mode. The signal switched in accordance with modes shown in table 2-4 is output from pin ⑦, then sent to Y board via pin 25c of connector BB-1. Pin ⑨ is held to H level if input signal is 3-value SYNC.

3-2-3. AUDIO Section

A signal (R, L MIX signal), connected to switcher, enters to pins ② of IC408, 409 via pin ① of connector BB-2.

Also, R, L signals entered to SLOT A and SLOT B pass through pins 13a and 14a of connector BB-1, then MIXed by Q525, 526, 527, 532, 533, and enter to pins ⑫ of IC408, 409. Operating modes of IC408 and 409 are controlled as shown in Fig. 2-1, and they output signals from pin ⑭.

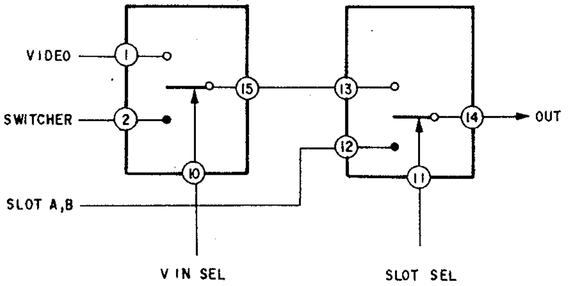


Fig. 2-1.

R, L signals thus switched enter to pins ⑥ and ④ of IC412, and are attenuated in accordance with the voltage applied to pins ② and ⑧ (VOL CONT terminals). R, L signals are output from pins ⑦ and ③, then sent to KA board via pins 3c and 3b of connector BB-1.

3-2-4. SIRCS Signal Circuit

The signal received by opto-receiver of the projector enters to pin 1c of connector BB-1, and the signal sent from the commander supplied with the main unit enters to pin 1b of connector BB-1, and the signal from the switcher enters to pin ③ of connector BB-2, respectively. The signal received by opto-receiver passes Q450, 451, a switch built in SIRCS IN terminal, then D450 and Q454, and is sent to pin 23c of connector BB-1. The signal is also sent to SIRCS OUT terminal via Q456. The signal sent from the commander supplied with the main unit enters to D450.

The signal from the switcher enters to Q453, then passes through the signal path described above.

The switch built in SIRCS IN terminal is turned OFF when a plug is inserted to SIRCS IN, and is turned ON when the plug is pulled out from SIRCS IN. Thus, wireless input of the main unit (signal from opto-receiver) is disabled when a plug is inserted, and the wired-input signal inserted to the terminal enters to D450 in return.

3-2-5. CLEAR BLUE Circuit

Red signal clamped by Q650 and IC410 appears on Q651's collector in an inverted waveform, and enters to Q652. Green signal enters to Q703 in a similar manner. Emitters of Q652 and Q703 are connected in common, and only the signal from transistor with lower base voltage (i.e., the signal with higher video level) appears on this point. The signal passes R708, 717, then enters to bases of Q704 (1/2) and Q707 (2/2). On the other hand, Blue signal appears on collector of Q751 in an inverted waveform, and enters to Q752. The signal passes R711, 714, then enters to bases of Q704 (2/2) and Q707 (1/2).

DC level of R, G signal is determined by the voltage supplied from Q753 (base voltage - V_{BE} determined by R760, 761, 762) at the time of polarity inversion, and DC level of B signal is determined by the voltage supplied from Q754.

Also, emitter of Q704 is connected to collector of Q705, and G signal's current flows in accordance with G signal applied to the base of Q705. Emitter of Q707 is connected to collector of Q709, and B signal's current flows in accordance with B signal applied to the base of Q709.

If C.B. SW (Clear Blue Switch) is turned OFF, then Q756 is turned ON. This causes the base voltage of Q704 (1/2) & Q707 (2/2) be held "Low", consquently Q704 (1/2) & Q707 (2/2) be turned OFF, and Q704 (2/2) & Q707 (1/2) be turned ON. Also, inverted waveform of G signal appears on collector of Q704 (2/2). The signal is inverted again in Q708, and enters to pin ④ of IC415.

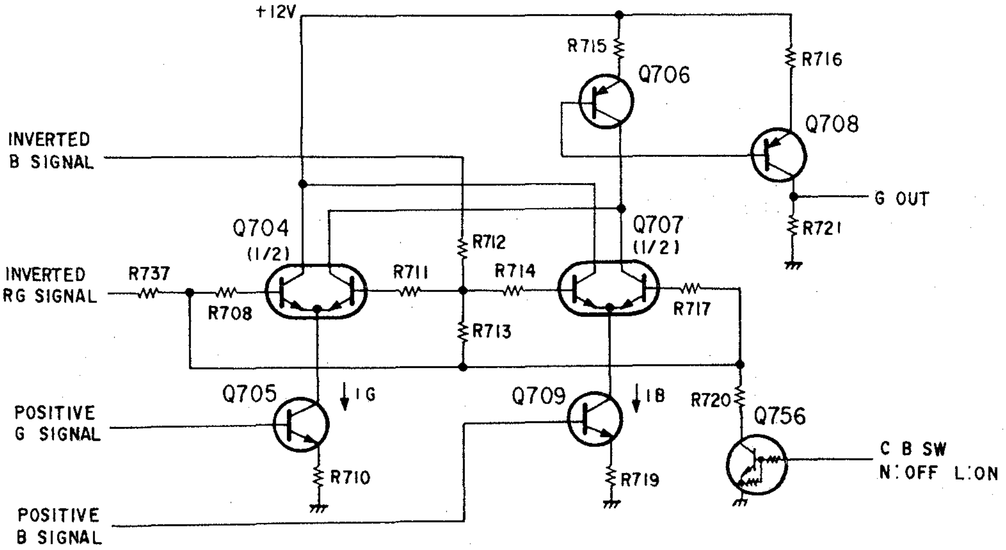


Fig. 2-2.

If C.B. SW is turned ON, the circuit compares base voltage of Q704 (1/2) & Q707 (2/2) to that of Q704 (2/2) & Q707 (1/2) to turn the transistor with higher base voltage ON. As the result, Q707 (2/2) & Q704 (1/2) are turned ON if B signal's level is higher than that of R, G signal, and MIXed signal of G and B signals enters to the base of Q708.

If B signal's level is lower than that of R, G signal, Q707 (1/2) & Q707 (2/2) are turned ON, and only G signal is applied to the base of Q708.

Thus, Clear Blue operation is to add G signal to B signal to cause Blue color be turned into Cyan color.

3-2-6. TEST SIGNAL Generator

Following test signals enter from connector BB-1 and are applied to IC413:

Test Signal	Pins of Connector BB-1	Pins of IC413
SG signal (test signals such as HATCH, DOT, etc.)	28a, 28b	12, 8
C.BRT signal (applies highlight and shade to picture in ZONE mode)	28c, 29c	7, 6
BOARDER signal (shadow portion of character signal)	29a, 29b	3, 2
PLUGE signal	27a, 27b	14, 13

Table. 2-5.

IC413 generates TEST signals based on input signals said above, and outputs them from pins ⑤ and ⑩. The test signal thus output enters to pins ⑦ and ⑧ of IC414, 415, 416, and is switched by NOR/TEST and VIDEO/RGB signals applied to pins ⑤ and ⑥ of these ICs, then is output from pin ⑪ of ICs.

Also, RGB character signals entered from pins 30A, 30B, 30C, 31C, 31A, 31B of connector BB-1 are applied to pins ⑨ and ⑩ of IC414, 415, 416, and are output after superimposed on RGB, VIDEO, and TEST signals applied to pins ②, ④, ⑦, ⑧ of ICs.

3-2-7. CODE Generator

Codes are generated by IC422, 423, 424, and transistors, diodes located around these ICs. Relationship between input and output signals is as shown in a table below:

signal applied to PJ			VIDEO	Y/C	col. dif.	col. dif. IDTV	col. dif. IDTV	RGB 2-V*	RGB 3-V*	HD 2-V*	HD 3-V*
BB IN	RGB/VIDEO	BB-1 3A BB-2 pin ⑤	L	L	M	M	M	H	H	H	H
	VIDEO/YC	BB-1 2B BB-2 pin ④	H	L	H	L	M	–	–	–	–
	HDVS SEL	BB-1 22A	H	H	H	H	H	H	H	L	L
BB OUT	VIDEO/YC	BB-1 25B	H	L	H	L	L	–	–	–	–
	RGB/VIDEO	BB-1 25A	L	L	L	L	L	H	H	H	H
	TRI/NOT	BB-1 24C	–	–	–	L	H	L	H	L	H
	CODE 3	BB-1 26B	H	H	L	L	L	H	H	L	L

*: 2V → 2-valuses, 3V → 3-values
– : don't care

Table. 2-6.

3-3. CIRCUIT OPERATION OF CA (RG) AND CA (B) BOARDS

Major function of these boards are video signal processing in R.G.B channel, video output, AUTO BACKGROUND circuit, single-tube ABL circuit, peak ABL circuit, Σ ABL circuit, and G1 BLANKING circuit.

3-3-1. Video Signal Processing (TY885002A)

Signal processing such as controls, cut-off switches, blanking, pedestal clamp, etc., to Background, Drive, Contrast, Brightness is done using hybrid ICs IC104, 204, and 304 (TY885002A). Fig. 1 shows the block diagram of this hybrid IC. This hybrid IC operates by entering various pulses with amplitude of 5Vp-p.

Video signal enters to pin ㉖ with capacitor-coupling, and is clamped at its back-porch by B.P.C.P. applied to pin ㉕.

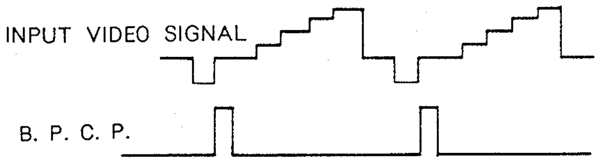


Fig. 3-2.

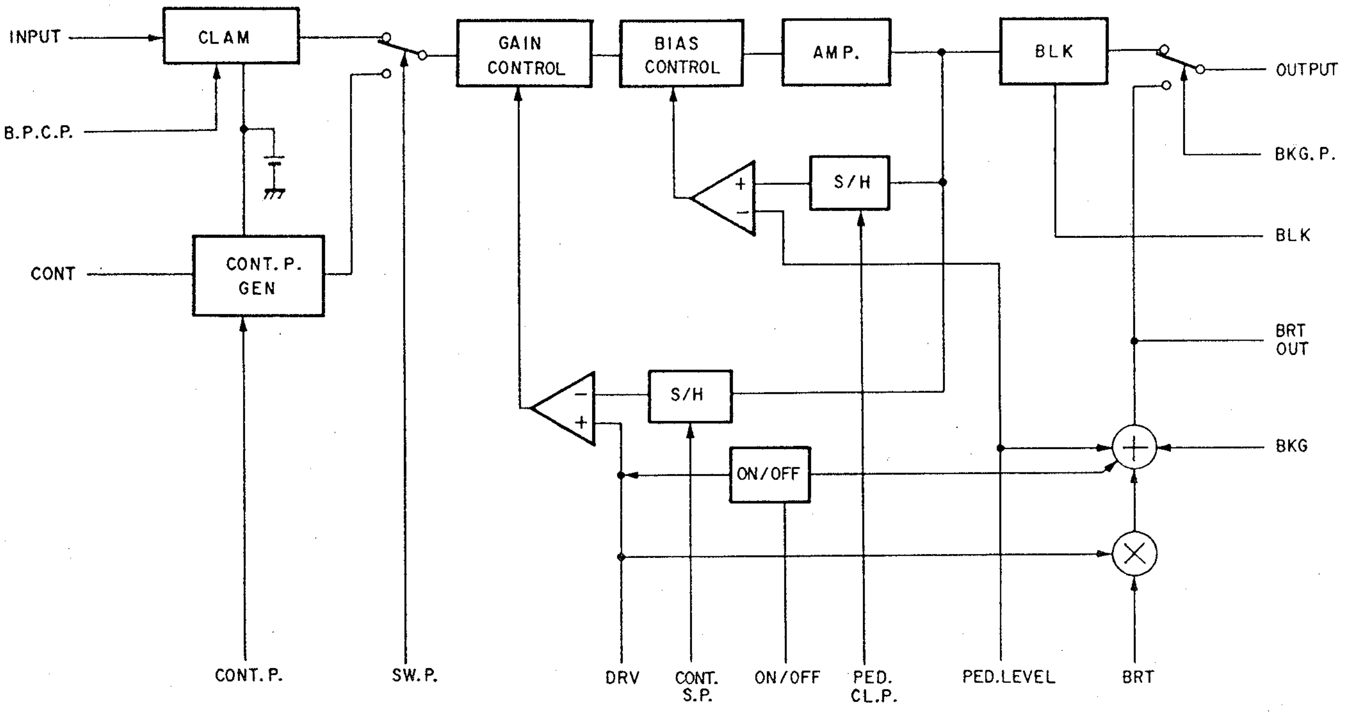

INPUT
CLAM
B.P.C.P.
CONT
CONT. P.
GEN
GAIN
CONTROL
BIAS
CONTROL
AMP.
BLK
OUTPUT
BKG. P.
BLK
BRT
OUT
BKG
+
−
S/H
−
+
S/H
ON/OFF
CONT. P.
SW. P.
DRV
CONT.
S.P.
ON/OFF
PED.
CL.P.
PED.LEVEL
BRT

Fig. 3-1. TY885002 Block Diagram

After that, a pulse for gain control (CONTRAST pulse) is inserted to H. BLK interval of the video signal using switching pulses (SW.P.) entered to pin㉔. Insert timing of CONTRAST pulse is determined by the pulse applied to pin㉒, and its amplitude is controlled by DC voltage applied to pin㉓.

After insertion of CONTRAST pulses, video signal passes a GAIN CONTROL amplifier, and is pedestal-clamped by Ped. Cl. P (pin⑱) with the timing shown in Fig. 3-3. The IC samples and holds the amplitude of CONTRAST pulse to compare it to reference C. Based on error voltage between the two, the IC controls gain of the GAIN CONTROL amplifier. That is, a feedback is done to make the amplitude of CONTRAST PULSE be equal to the value of reference C.

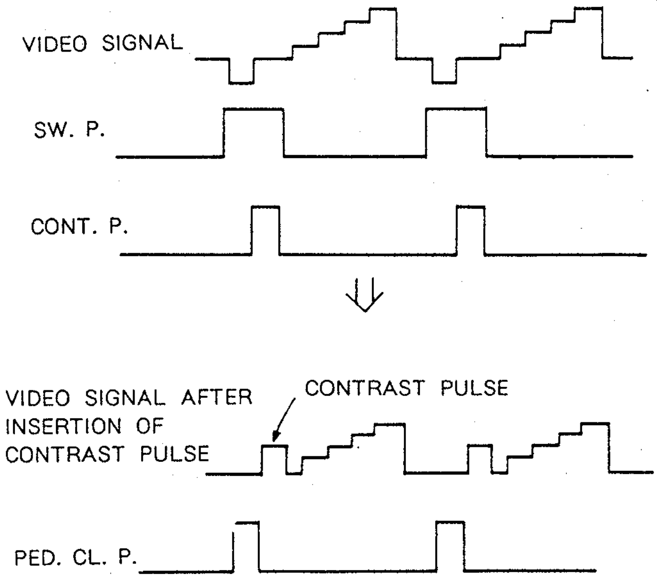

VIDEO SIGNAL
SW. P.
CONT. P.
VIDEO SIGNAL AFTER INSERTION OF CONTRAST PULSE
CONTRAST PULSE
PED. CL. P.

Fig. 3-3.

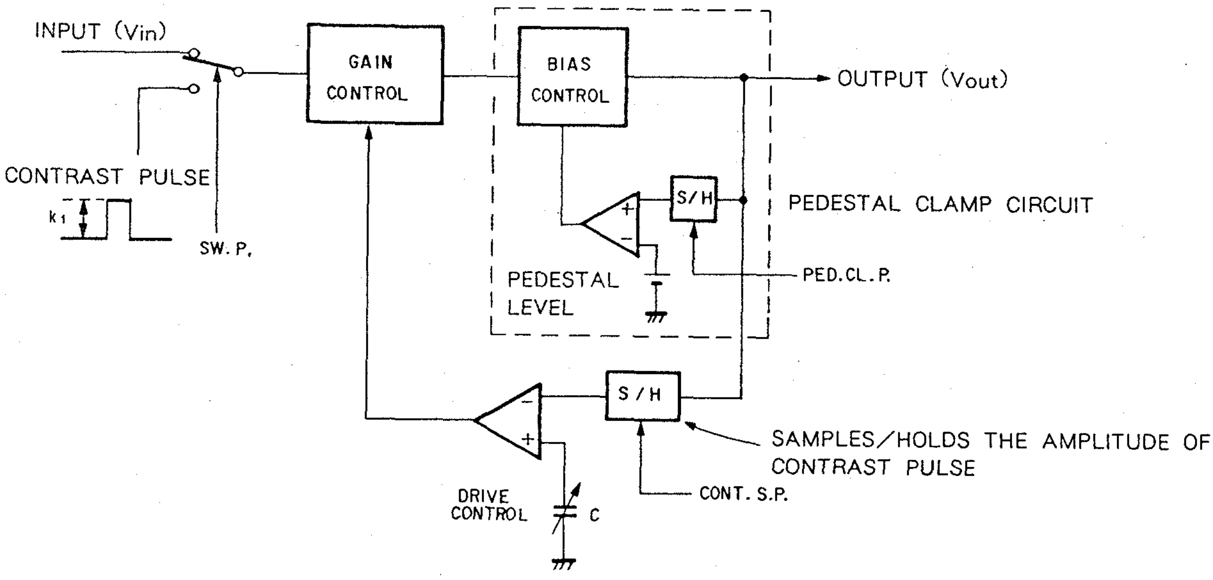

INPUT (Vin)
CONTRAST PULSE
k1
SW. P.
GAIN CONTROL
BIAS CONTROL
OUTPUT (Vout)
S/H
+
−
PEDESTAL CLAMP CIRCUIT
PED.CL.P.
PEDESTAL LEVEL
S/H
−
+
SAMPLES/HOLDS THE AMPLITUDE OF CONTRAST PULSE
CONT. S.P.
DRIVE CONTROL
C

Fig. 3-4.

Contrast control is done by changing k_1 (changing DC voltage on pin ㉓), and Drive control is done by changing c (changing DC voltage on pin ⑨).
With this technic, control to CONTRAST and DRIVE is done using only a single gain-control amplifier.
After control to CONTRAST and DRIVE completed, blanking is done to the video signal using BLANKING PULSE applied to pin ⑤ (Fig. 3-6).

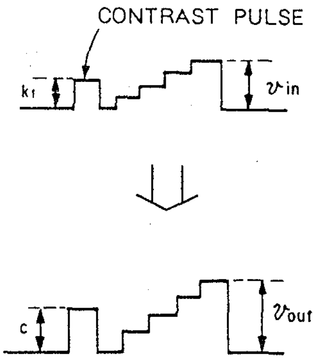

CONTRAST PULSE
k1
vin
c
vout

Fig. 3-5.

As shown in Fig. 3-5, gain in this stage (Gv) is calculated using following equation:

$$G_v = \frac{V_{out}}{V_{in}} = \frac{c}{k_1}$$

where: k_1 = amplitude of input CONTRAST PULSE
c = amplitude of output CONTRAST PULSE

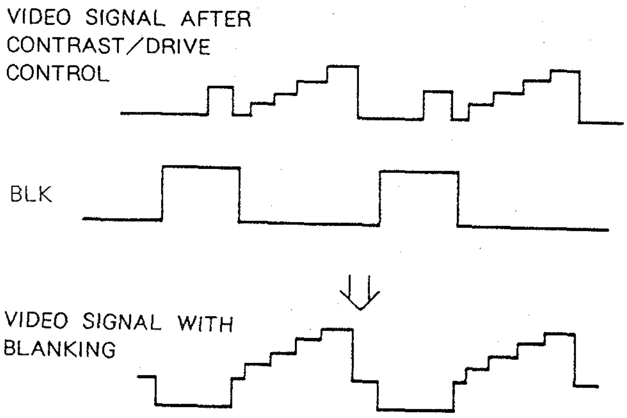

VIDEO SIGNAL AFTER CONTRAST/DRIVE CONTROL
BLK
VIDEO SIGNAL WITH BLANKING

Fig. 3-6.

A pulse (BRT. Pulse) for brightness and background control is inserted to V. BLK interval of video signal. Timing of this pulse is determined by the pulse applied to pin ⑦, and its amplitude is controlled by current sinked into pin ⑧ (BKG terminal) and voltage applied to pin ⑩ (BRT terminal). Thus, video signal with BRT. Pulse inserted is output from pin ③. Pedestal level of the output video signal is constant, and information concerning BRIGHT and BACKGROUND is provided in the amplitude of BRT. Pulse. That is, pedestal level, hence brightness of picture, changes in accordance with the change of BRT. Pulse's amplitude by maintaining the cathode current at the time of BRT. Pulse constant (refer to 3-4. AUTO BACKGROUND circuit section).

3-3-2 γ-Correction Circuit

For correction of white balance at the intermediate level, γ-correction circuits are installed between signal-processing hybrid ICs (IC104, 304) and video output ICs (IC101, 301) on Red and Blue channels.

γ-correction circuit in Red channel has configuration shown in Fig. 3-7.

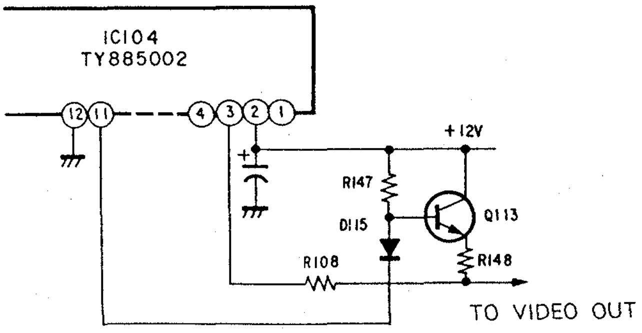


Fig. 3-7

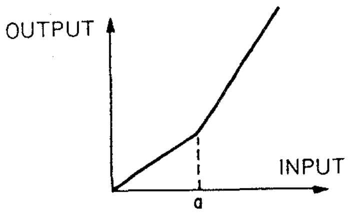


Fig. 3-8. γ-correction characteristic in Red channel

This circuit shows bending-characteristic as shown in Fig. 3-8.

Because the pedestal level is constant in this signal-processing circuit system, it is necessary to change the location of bending point (point-a in Fig. 3-8) of γ-characteristic in accordance with brightness level.

To achieve this, DC output voltage from pin ⑪ (BRT OUT terminal) of TY885002A is applied to the base of Q113 via D115 to change the location of bending point in accordance with brightness level because amplitude of this DC voltage is same with that of BRT. Pulse to be inserted into video signal.

In this case, the signal level at the bending point is almost same with the level of BRT. Pulse.

IC305 (TY911504) is used in γ-correction circuit for Blue channel.

This hybrid IC shows a curved, bending characteristic as shown in Fig. 3-9.

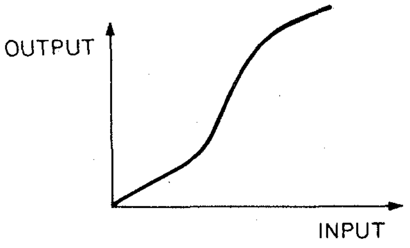


Fig. 3-9. γ-correction characteristic in Blue channel

Also it is necessary to change the location of bending point in accordance with brightness level, in this case however, it is done by connecting pin ⑪ (BRT OUT terminal) of IC304 to pin ⑦ of IC305.

Input terminal of IC305 (TY911504) is pin ⑩, and video signal (output from TY885002A) is applied to it. Also, the pedestal level (DC voltage) of the video signal is applied to pin ⑨. Video signal with γ-correction is output from pin ③ of this IC.

3-3-3. Video Out

A hybrid IC called "video pack" is used in video output circuit. Internal configuration of this IC consists of an ordinary cascode amplifier with resistive load and a complimentary buffer.

3-3-4. Auto Background Circuit

(Red channel is described here, but operation is same in Buie and Green channels)

This circuit prevents change in background (hence white balance) of picture caused by drift in Ekco of CRT, etc. This is achieved by inserting reference pulses (BRT. Pulse) to V. BLK interval of video signal to detect the cathode current at the reference pulse, then feedbacking is done to maintain the current thus detected constant. BRT pulse with 2H duration is inserted to V. BLK interval, and its timing pulse is applied to pin ⑦ of signal-processing hybrid IC (TY885002A). Detection of cathode current is done as follows: Q104 is a constant current source, and in normal state of operation, its source current flows into the base of Q105 to turn Q105 OFF. Q107 is disabled in this state, and the cathode current passes collector - emitter junction of Q105 and flows into emitter of Q103. In detecting cathode current at the timing of BRT pulse, IkDS pulse with 3H duration (which includes BRT pulse) is applied to the base of Q106 via Q112 to turn Q106 ON.

Accordingly, current from constant current source (Q104) flows into collector of Q106, and Q105 is turned OFF. This causes cathode current flow from emitter to collector of Q107. This collector current is converted into voltage by detecting it using R135. The cathode current thus converted into voltage passes a voltage follower (2/2 of IC102), and is sampled and held by Q111, R142, C119, then is applied to + input terminal of a comparator (1/2 of IC102) to compare it to a constant voltage (about 0.5V). The error voltage is applied to the base of Q101 via D112, then passes Q102, Q115, and controls G1 voltage.
That is, feedbacking to control G1 voltage is performed by maintaining cathode current at the timing of BRT pulse constant (about 5μ A).

AUTO BACKGROUND circuit operates as described above, however, its operation may be disabled (control to Background and Brightness is disabled in this case) using AUTO ON/OFF control line. AUTO BACKGROUND circuit operates if this control line is OPEN, but connecting the control line to GND causes Q109 and Q110 be turned ON, and output voltage from IC102 (1/2) become about -12V to turn D112 OFF. Also, Q108 is turned ON and R137 is connected to +12V line. A constant voltage is applied to the base of Q101, and keeps G1 voltage to a fixed level, and AUTO BACKGROUND circuit stops its operation.

3-3-5. Single-tube ABL Circuit

In normal state of operation (when IkDS pulse is LOW), cathode current of Red channel is added to the current of constant-current source (Q104), and flows from emitter to collector of Q103, then is converted into voltage using R130 and R32. The voltage is integrated by R37 and C19, then enters to the base of Q18. In same manner, cathode current of Green and Blue channels enter into bases of Q17 and Q16. Because emitters of Q16, Q17, and Q18 are connected together, voltage with the highest level out of R, G, and B passes an inverted amplifier (2/2 of IC8) via Q19, and enters to a comparator (Q15). If one of cathode current of R, G and B exceeds a level, Q15 is turned ON to decrease the voltage on CONTRAST control line, hence CONTRAST of picture.

3-3-6. Peak ABL Circuit

Cathode current detection section in this circuit is common with that of Single-tube ABL circuit above. Cathode current detected in R, G, B channels are MIXed by R34, R33, and R32. It passes an inverted amplifier (1/2 of IC8) then enters to a comparator (Q14). If the MIXed cathode current exceeds a level, Q14 is turned ON to decrease the voltage on CONTRAST control line, hence CONTRAST of picture.

3-3-7. Σ ABL Circuit

ABL voltage, detected from the secondary winding of flyback transformer, enters from pin ③ of CAB-7 and is applied to the base of Q30. The ABL voltage is compared to the base voltage of Q31. If it becomes lower than the base voltage of Q31, Q31 is turned ON to decrease the voltage on CONTRAST control line, hence CONTRAST of picture.

3-3-8 Generators of Various Pulses

Various pulses, used in processing video signals, are generated in IC4 to IC7. Fig. 3-12 shows the timing chart of these various pulses. Fig. 3-13 is the timing chart of pulses in H period. Most of signal processing pulses are generated in IC5 (MB675429: a gate array). In addition to HD and VD, a 1/2H pulse which rises at the center of HD pulse is required as input to MB675429. This 1/2H pulse is generated by a monostable multi-vibrator IC4. For blanking pulses, transistors Q8 to Q10 prevent blanking during interval of IkDS pulse because no blanking is allowed during interval of BRT pulse for BACKGROUND control (interval of IkDS pulse includes the interval of BRT pulse). Also, a circuit (consists of C22, R42, D12, and D13) is used to perform blanking for a short time at power ON to projector. A circuit (consists of Q11, Q12, D14, D15, R48, and C26) is used to perform blanking at power OFF of the projector.

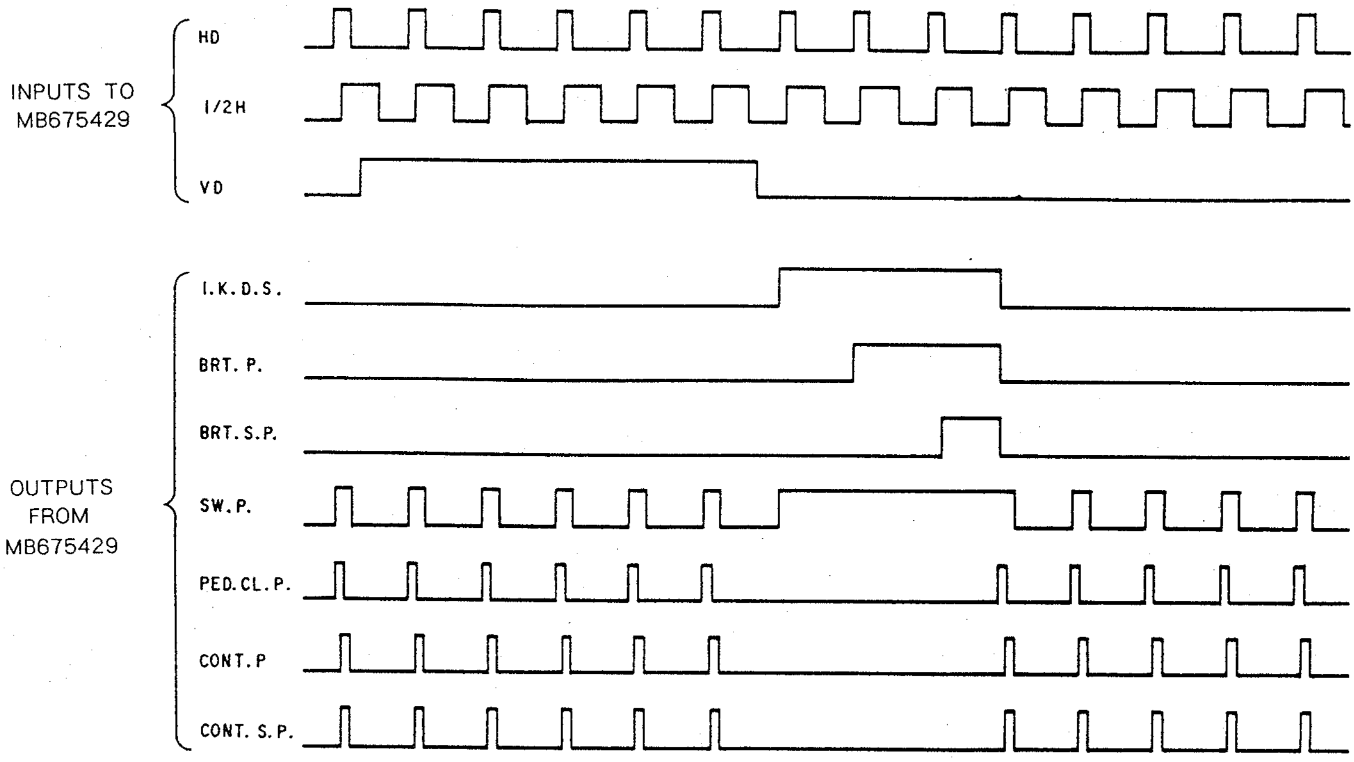


Fig. 3-12. Timing chart of various pulses

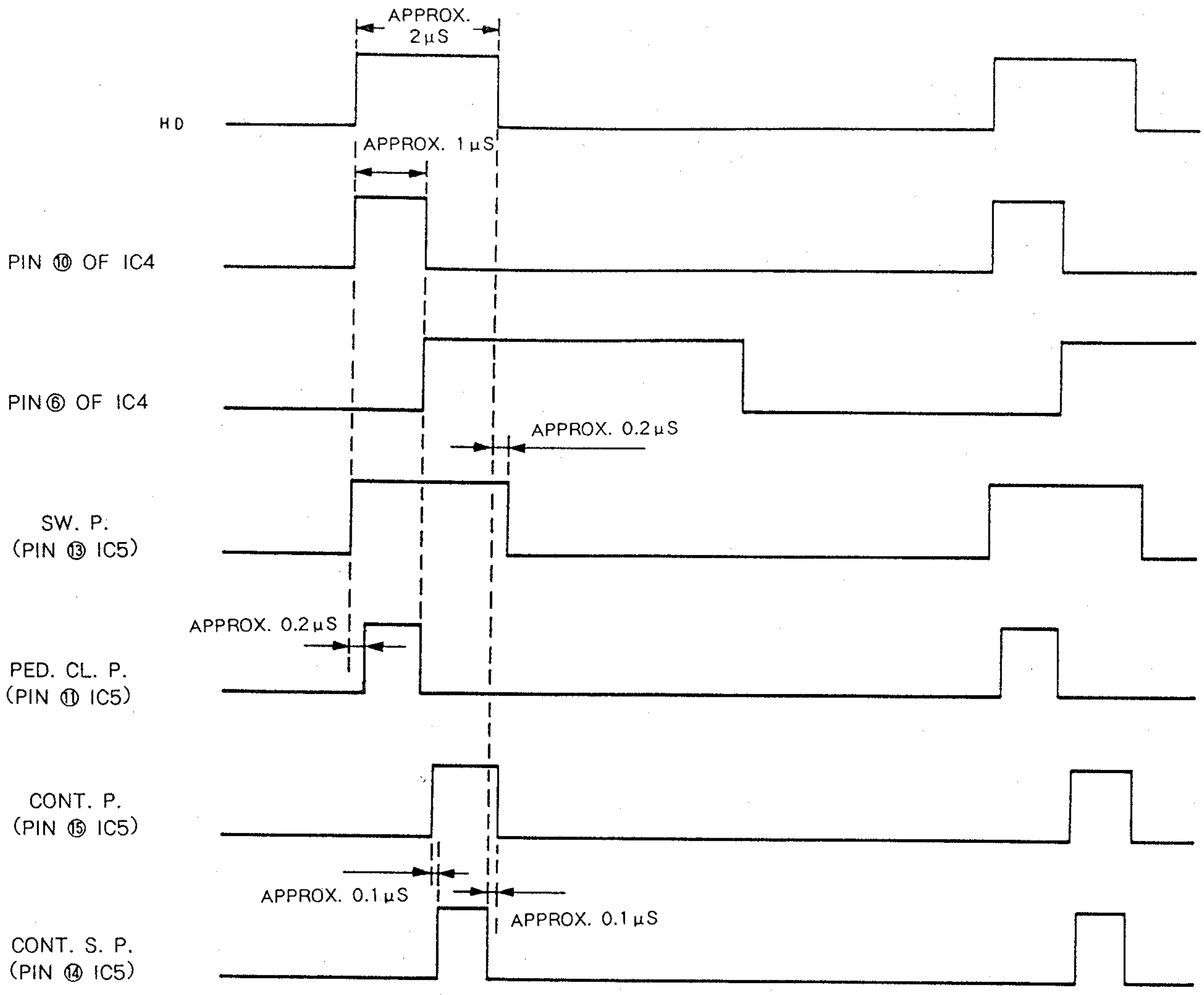


Fig. 3-13. Timing Chart of Pulses in H-period

3-3-9 ± 12V Line Protector

Power supply to this projector is cut off by connecting pin ⑩ or pin ⑫ of CAR-4 to GND. Power supply is cut-off to protect the projector when ± 12V lines on CA (RG) or CA (B) board are short-circuited or voltage on these lines decreases by some reasons. This circuit consists of Q2 to Q4 and components around them. If the voltage on +12V line decreases below zener voltage of D3, Q3 is turned OFF and Q2 is turned ON. This pulls pin ⑩ of CAR-4 down to GND. Also if voltage on -12V line inreases, Q4 is turned ON. This pulls pin ⑫ of CAR-4 up to GND. Thus, protection for ± 12V line is activated.

3-3-10 G1 Blanking Circuit

Blanking pulse, output from pin ⑫ of IC6, passes through Q11 and enters to pins ⑤ (BLK terminal) of IC104, 204, and 304. Blanking pulse also enters to G1 blanking circuit. Blanking pulse from pin ② of CAB-5 and IkDS from pin ④ of CAB-5 are MIXed by transistors Q33 and Q32, then pass a buffer (Q34 and Q35) and enter to an inverting amplifier (Q36 to Q38).

First, let blanking pulse rise from Low to High. This causes Q36 and Q38 be turned ON, and Q37 be turned OFF. Voltage on Q38's collector is pulled down to about -100V. When blanking pulse falls from High to Low, Q36 and Q38 are turned OFF, and Q37 is turned ON. Voltage of Q38's collector increases by a summed voltage (24V) across zener diodes D33 and D34 up from about -100V. Thus, blanking pulse of 24Vp-p with its lower limit at about -100V is generated. The blanking pulse enters to G1 control circuits, and after level-shifted, is applied to G1 of R, G, and B channels.

3-4. CIRCUIT OPERATION OF DA BOARD

Functions on DA board may be classified as shown below:

(1) AFC circuit
(2) V. HOLD circuit
(3) H.V. SHIFT circuit
(4) BLK circuit
(5) Registration waveform generator
(6) Miscellaneous

This section describes the signal flow based on the block diagram of DA board shown in Fig. 4-1

H. PULSE (12Vp-p) generated in retrace time of horizontal deflection enters to 7-B from E board. The pulse is distributed to 3 circuits. One enters to AD. HD waveform generator (1) to generate pulse in timing advanced by 1 to 3 μ s than HD. This is sent to registration waveform generator as trigger pulse for horizontal registration waveforms. The 2nd one enters to H. BLK circuit (2) and is used as the trigger to H. BLK.
The 3rd passes HF. HD circuit (3) and H. SHIFT circuit, then enters to circuit (6). H. SYNC for AFC enters from 8-A.

From Y board, V. SYNC enters to 9-A. It passes V. SHIFT circuit (5) and enters to V. HOLD circuit. Output from V. HOLD circuit is called as VD, and is sent to registration waveform generator (9) as the trigger to vertical registration waveforms.

External V. SIN generator (10) and H. SIN generator (11) are used because registration IC, used in the registration waveform generator, provides no SIN output.
To prevent beam concentration by too small raster size, a size ABL circuit (14) is used for protection from damage to CRT phosphor.

DA BOARD BLOCK DIAGRAM

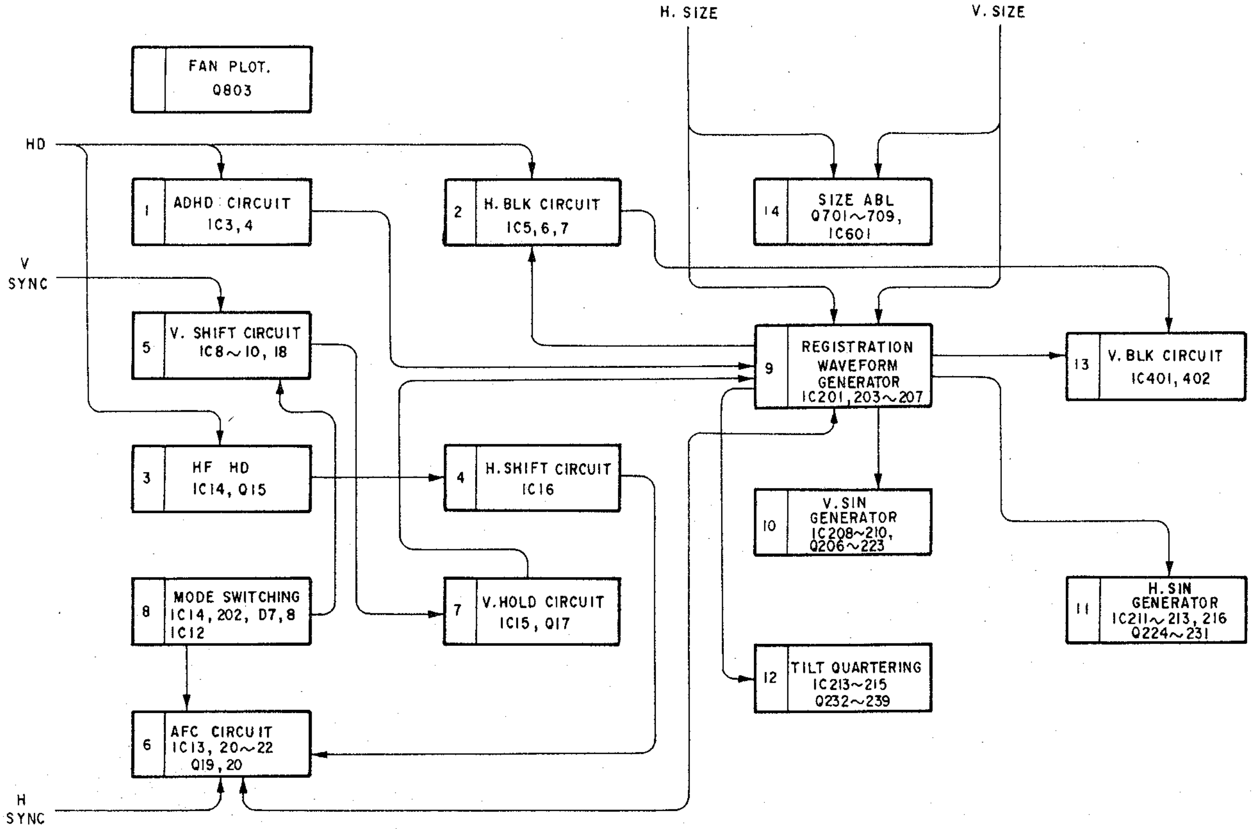

H. SIZE
V. SIZE
FAN PLOT.
Q803
HD
1
ADHD CIRCUIT
IC3,4
2
H. BLK CIRCUIT
IC5,6,7
14
SIZE ABL
Q701~709,
IC601
V
SYNC
5
V. SHIFT CIRCUIT
IC8~10, 18
9
REGISTRATION
WAVEFORM
GENERATOR
IC201,203~207
13
V. BLK CIRCUIT
IC401, 402
3
HF HD
IC14, Q15
4
H. SHIFT CIRCUIT
IC16
10
V. SIN
GENERATOR
IC208~210,
Q206~223
8
MODE SWITCHING
IC14, 202, D7,8
IC12
7
V. HOLD CIRCUIT
IC15, Q17
11
H. SIN
GENERATOR
IC211~213, 216
Q224~231
12
TILT QUARTERING
IC213~215
Q232~239
6
AFC CIRCUIT
IC13, 20~22
Q19, 20
H
SYNC

Fig. 4-1.

Basic Circuit on DA board (I)

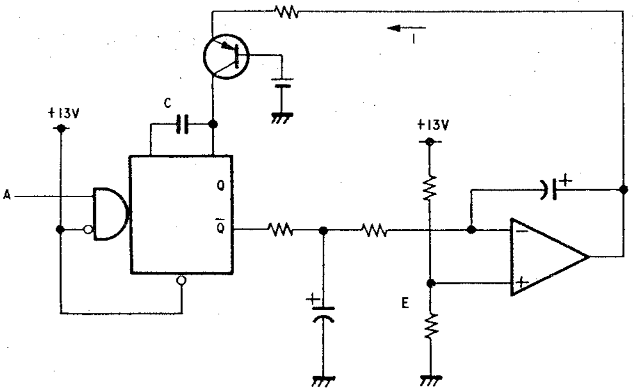


Fig. 4-2.

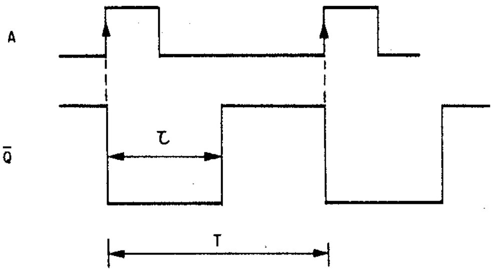


Fig. 4-3.

Using positive-going edge of square waveform of A input as the trigger, the basic circuit generates pulse with duty of τ/t at $\overline{Q}$ output. Circuit shown above is a monostable multivibrator of feedback type, and feedback is done to make the integrated voltage of $\overline{Q}$ output be equal to the reference voltage E of operational amplifier. Because +B = 12V, $\overline{Q}$ output is the pulse with amplitude of 12V. Integrated voltage (E') of $\overline{Q}$ output is calculated using following equation:

$$E' = (T - \tau) \times 12/T = E$$

where : T is the time of 1H or 1V

For example, when generating a pulse with duty of 50%, $\tau/T = 0.5$. You can calculate E by following equation :

$$E = (T - \tau) \times 12/T = (1 - \tau/T) \times 12 = 6\,(V).$$

Basic Circuit on DA board (II)

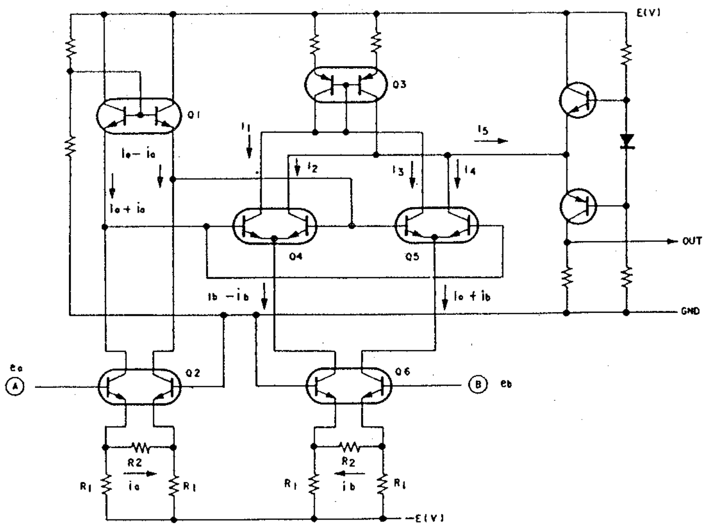


Fig. 4-4.

The circuit above is a multiplier with ea to Q2 and eb to Q6 as their inputs (ea and eb > 0).

Io (idling current at ea, eb = 0) is calculated using following equation :

$$Io = (E - V_{BE}) / R1,\ i_a = e_a/R2,\ i_b = e_b/R2$$

where : ia and ib are increase in current caused by increase in input voltage

Following relationship exists between voltage and current in semiconductor:

$$i_D = I_D\left(\varepsilon^{\frac{qV}{kT}} - 1\right) \fallingdotseq I_D\,\varepsilon^{\frac{qV}{kT}}$$

Taking logarithm of equation above, following equation is obtained:

$$1n\,(i_D) = 1n\,(I_D) + \frac{qV}{kT}$$

Applying equation above to Q1 and Q2, then:

$$V = \frac{kT}{q}\,(\ln (i_D - \ln (I_D))$$

$$V_a = E1 - \frac{kT}{q}(\ln (I_o + i_a) - \ln (I_D)) \cdots\cdots\cdots (1)$$

$$V_b = E1 - \frac{kT}{q}(\ln (I_o - i_a) - \ln (I_D)) \cdots\cdots\cdots (2)$$

$$V_a - V_b = \frac{kT}{q}\,(\ln \frac{(I_o + i_a)}{(I_o - i_a)}) \cdots\cdots\cdots\cdots\cdots (3)$$

Applying the equation to Q4, Q5 and Q6 in similar way:

$$V_a - V_b = \frac{kT}{q}(\ln \frac{I_2}{I1}) = \frac{kT}{q}(\ln \frac{I_3}{I_4}) \cdots\cdots\cdots (4)$$

From equations (3) and (4),

$$\frac{I_2}{I_1} = \frac{I_O - i_a}{I_O + i_a} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (5)$$

$$\frac{I_3}{I_4} = \frac{I_O - i_a}{I_O + i_a} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (5)$$

From circuit diagram,

$$I_3 + I_4 = I_O + i_b \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (7)$$

$$I_1 + I_2 = I_o - i_b \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (8)$$

From equations (5), (6), (7) and (8),

$$I_1 = (I_o - i_a)(I_o - i_b)/2i_O \cdots\cdots\cdots\cdots\cdots\cdots\cdots (9)$$
$$I_2 = (I_O + i_a)(I_O - i_b)/2i_O \cdots\cdots\cdots\cdots\cdots\cdots\cdots (10)$$
$$I_3 = (I_O - i_a)(I_O + i_b)/2i_O \cdots\cdots\cdots\cdots\cdots\cdots\cdots (11)$$
$$I_4 = (I_O + i_a)(I_O + i_b)/2i_O \cdots\cdots\cdots\cdots\cdots\cdots\cdots (12)$$

Because $I_1 + I_3 = I_2 + I_4 + I_5$, by substitution of equations (9), (10), (11) and (12),

$$I5 = -2\,i_a \bullet i_b/I_O$$

3-4-1. AD•HD Circuit

In correction of registration using SUB-DY, some delay occurs between correction waveform and picture movement on CRT screen because of various conditions such as eddy current, etc. To make the picture movement on CRT screen ideal, it is necessary to advance the timing of correction waveform by 0.5 to 1 μS than that of HD pulse for horizontal deflection. Based on results of various experiments, the absolute value of this timing is nearly constant regardless of f_H.

Using positive-going edge of HD pulse as the trigger, this circuit generates a pulse with width of τ (pin ⑥ of IC3). The pulse width(τ) is wider by 0.5 to 1 μS than that of HD pulse (t = 0.5 to 1 μS). This pulse is integrated, and the result of integration is used as the reference.

Other monostable multivibrator generates a pulse using negative-going edge of HD pulse as its trigger. A feedback system is used to compare this pulse with the result of integration of $\overline{Q}$ output (pin ⑨ of IC3).

The feedback system operates to make width of pulse on pin ⑥ of IC3 be equal to that on pin ⑨ of IC3. Because width of HD pulse is about 2 μS, selecting component values to achieve pulse width τ be 2.5 to 3 μS makes t be 0.5 to 1 μS. Consquently, positive-going edge of waveform on pin ⑨ of IC3 virtually advances by 0.5 to 1 μS than HD pulse. This is called as AD. HD, and is applied to the registration IC to be used as trigger for registration waveforms (refer to basic circuit on DA board (I)).

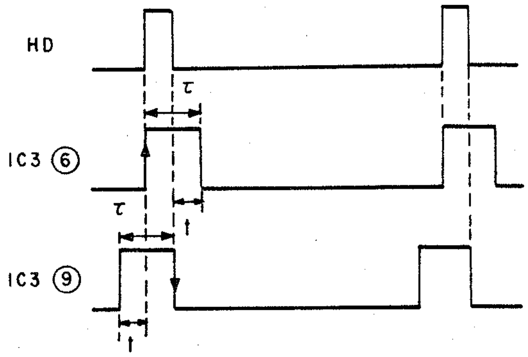


Fig. 4-5.

3-4-2. V. BLK Circuit

V. registration waveforms are generated using VD (V drive pulse after V. HOLD) as trigger. V. SAW is selected from waveforms above, and applied to IC401. In IC401, V. SAW is compared to DC voltage called BLK (T), (B), then is added to VD to generate V. BLK signal.
DC voltage of BLK (T), (B) determines the timing when V. BLK be applied, and changing BLK (T), (B) causes pulse width on pin ⑦ of IC401 be changed, hence the position of V. BLK.

Changing V size also changes amplitude of V. SAW waveform, hence the pulse width of V. BLK.
In this case, however, DC voltage called BLK (T), (B) does not change. So, BLK position on projector screen does not move.

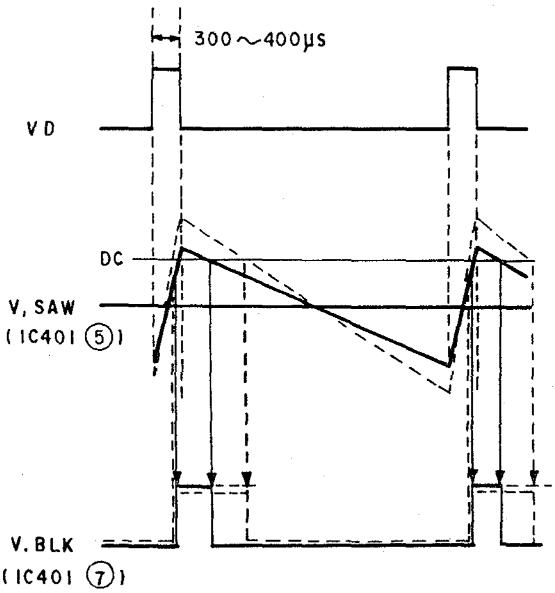


Fig. 4-6.

3-4-3. H. BLK Circuit

Generation of H. BLK is done based on a concept similar to the case of V. BLK. If constructed a circuit of system same with that of V. BLK, however, two BLK pulses are generated as shown in timing chart (right) because AD.
HD is used as the trigger to generate registration correction waveforms.
The reason is, H. SAW is generated in advanced timing using AD. HD.

To avoid this problem to occur, H. BLK pulse is generated using the negative-going edge of HD pulse as the trigger. Pulse width is determined in a same manner as in case of V. BLK, that is, H. SAW registration correction waveform is compared to DC voltage called BLK (L), (R), and its integrated voltage is used as the reference.
H. SAW is applied to IC7, and is compared to DC voltage called BLK (L), (R).
Voltage obtained by integration of pulses output from pin ⑦ and pin ① of IC7 is the reference voltage of H. BLK (L), (R) respectively.
HD is applied to pin ④ of IC5 to generate a pulse with width of w. Generation of this pulse is done as follows: Reference voltage generated by IC7 enters to IC6. IC5 and IC6 forms a feedback loop to generate a pulse (H.BLK (L)) having same width with the pulse generated by comparation in IC7, at the timing of positive-going edge of HD.
In same manner, HD is applied to pin ⑫ of IC5 to generate a pulse with width of w'. This is H. BLK (R). H. BLK (L) and H. BLK (R) are generated separately, and are added together in IC402. (see timing chart to the right). (refer to basic circuit on DA board).
Decoder IC (IC402) adds together H. BLK and V. BLK said above to generate composite BLK signal.

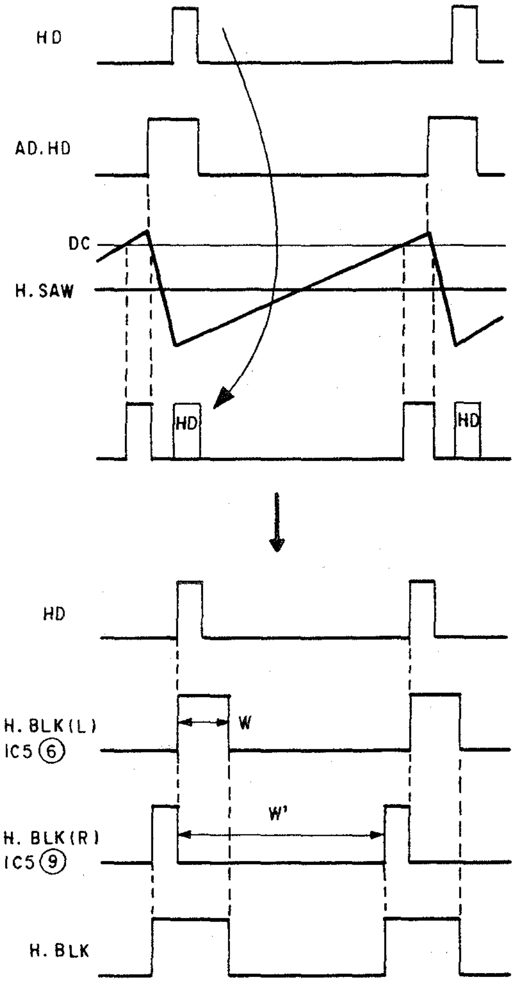


Fig. 4-7.

3-4-4. HF. HD Circuit

Result of integration of HD pulse is compared to Vcc/2 to generate a pulse being triggered at the center of HD pulse. This pulse is used in Y board to indicate center position of built-in signals.

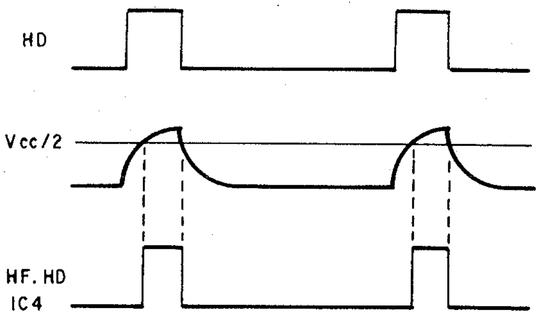


Fig. 4-8.

3-4-5. H. SHIFT Circuit

IC6 is H. SHIFT IC. This IC contains 3 set of "basic circuit (I) on DA board" connected in series.

HF. HD pulse is applied to pin ③, and is used as trigger to generate a square wave with duty of 50% in the 1st stage, and a square wave with variable duty of 50% ± 10% in the 2nd stage. Based on result of the 2nd stage, the 3rd stage generates a square wave with duty of 50% to be used as return of H. Pulse for AFC. ± 10% variable duty cycle in the 2nd stage causes output's duty cycle of the 3rd stage also change by ± 10% if compared to the input pulse. AFC synchronization is done based on SYNC and H. Pulse. Shift of video is done by changing the phase of a signal which substitutes for H. Pulse. Pin ② is SHIFT cont. terminal, and pin ⑧ is out terminal.

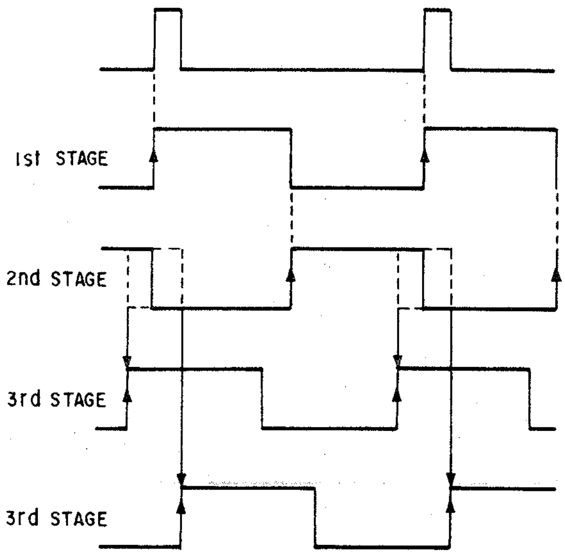


Fig. 4-9.

3-4-6. V. SHIFT Circuit

V. SHIFT circuit contains two circuits, i.e., NARROW V. SHIFT and WIDE V. SHIFT.

NARROW V. SHIFT circuit consists of IC10 and IC18, and WIDE V. SHIFT circuit consists of IC8 and IC9. IC10 is VIDEO V. SHIFT circuit, and IC12 selects one of these 3 signals in accordance with the type of input signal.

These circuits generate dummy V. SYNC signals which time-delayed to the original V. SYNC.

In WIDE V. SHIFT circuit, V. SYNC is converted to a pulse having amplitude of 12V using Q9. The signal is applied to pin ④ of IC8 to generate a pulse from Q output (pin ⑦ of IC8) with variable duty of 70% to 90%. Using this as trigger, monostable multivibrator of the next stage generates a pulse with duty of 20% (pin ⑨ of IC8). The pulse is delayed by 190% to 110% as compared to the original V. SYNC. In other words, timing of the pulse varies ± 10% as compared to the original V. SYNC (refer to "basic circuit (I) on DA board").

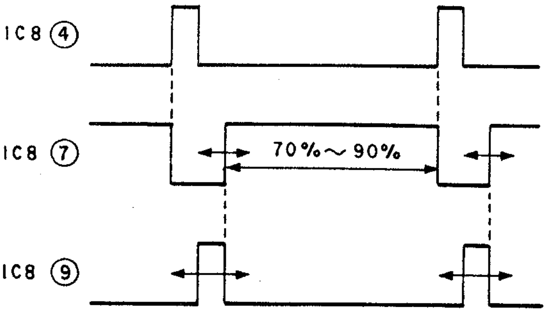


Fig. 4-10.

NOTE : In case of a special interlaced signal with different V period between adjacent fields, V jitter may occur if selected WIDE V. SHIFT circuit. Select NARROW V. SHIFT circuit described below in this case.

In NARROW V. SHIFT circuit, Q9's output is applied to pin ⑫ of IC10 to generate timing pulse delayed by 0% to 10% in ideal. Actually, minimum pulse width is limited to 200 μS because of restriction by the circuit system used. But the pulse width may be varied up to 10% of 1V period.

Both WIDE V. SHIFT and NARROW V. SHIFT circuits are controlled by DC voltage called "V. SHIFT" on 27-C of connector (refer to "basic circuit (II) on DA board").

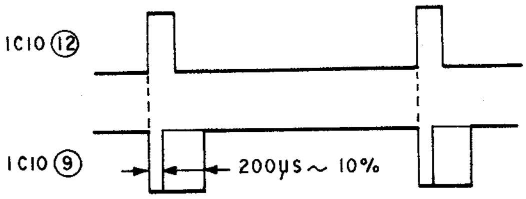


Fig. 4-11.

Because timing of front porch and back porch in video signal is different, VIDEO V. SHIFT signal is used to adjust (using RV5) picture position to come to the center of screen.

IC12 selects one of outputs from three V. SHIFT circuits, and IC13 generates dummy V. SYNC signal.

3-4-7. AFC Circuit

IC22 is jungle IC for AFC, and IC13, 20 and 21 are its peripheral circuit.

Pin ① of IC22 is SYNC IN terminal, and pin ② is SYNC SEP OUT terminal which outputs negative pulses with amplitude of 12V. It enters to pin ④ of IC13 to generate a pulse with width of w (pin ⑥ of IC13). The pulse is inverted (with its DC component be cut) in IC20 (pin ① of IC20), then after peak-hold, F-V conversion is performed. In this F-V conversion, RV2 is used to adjust for VFV = 2V at fH = 30kHz. A current-mirror circuit (Q19, Q20) is used to convert this F-V voltage into current. Free-run frequency is determined by this current output and capacitors (C66, C67) connected to pin ⑤ of IC22. RV1 is used in fine adjustment of free-run frequency.

Pin ③ is H. Pulse's return input terminal, and actually H. SHIFT output described above is applied to pin ③. Error voltage obtained by comparison between H. Pulse's return input and H. SYNC applied to pin ① is output from pin ④, and is fed back to pin ⑤ to determine the free-run frequency.

On pin ⑤, a voltage is generated as result of charging/discharging of current to/from C66 and C67. This voltage is compared to the voltage internally determined in the IC to generate H. OSC pulse. The pulse is sent to E board, and drive pulse for H. deflection is generated in this board.

Described above is the AFC for RGB system. In the AFC for VIDEO system, however, F-V conversion technique is not used, and taking fluctuation of SYNC into consideration, fo current is determined by a resistive divider.

When VIDEO is selected, the output of F-V conversion is reset to zero using IC14. If F-V conversion voltage decreases under reference voltage, output of IC17 becomes OPEN. Free-run frequency is determined by F-V voltage for VIDEO, which is provided by a resistive divider R177, 178, 179, Q22, and RV3. Fine adjustment is done by RV3. Other signal routes are same with that of RGB system.

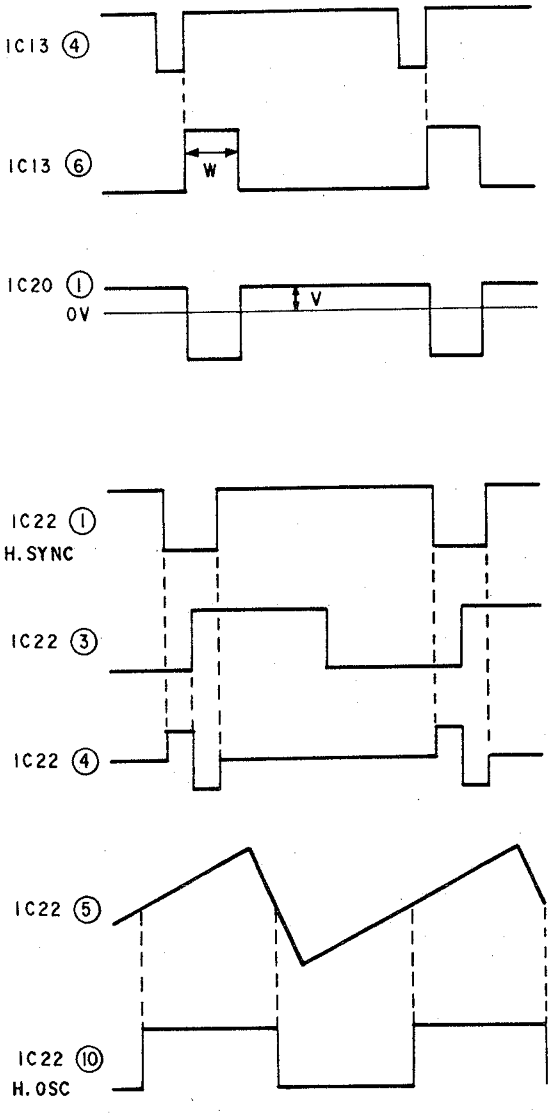


Fig. 4-12.

3-4-8. V. HOLD Circuit

IC15 is V. HOLD IC. Pin ⑥ is V. SYNC IND terminal, and actually a SYNC selected from V. SHIFT circuit's output signal is applied to it. Pin ⑦ is SYNC SEP OUT terminal, and its output re-enters to pin ④, then is applied to V. HOLD section. RV4 is used to control F-V conversion for MULTI-SCAN V. HOLD, and it adjusts fo of V. HOLD circuit.

Pin ② is V. HOLD output terminal, and V. HOLD is applied to correction waveform IC.

3-4-9. MODE Switching

This projector switches its AFC or V. SHIFT mode in accordance with VIDEO or RGB input. The switching is controlled from pin ① of IC14.

To avoid V. jitter, a V. SYNC before passing V. SHIFT circuits is selected.

If selected VIDEO and with no signal input, the system operates in RGB mode. The system operates in RGB mode when pin ① of IC14 is "H" level, and in VIDEO mode when it is "L" level.

INT/$\overline{\text{EXT}}$	X	L	H	H
VID/$\overline{\text{TEST}}$	L	H	H	H
NOR/$\overline{\text{TEST}}$	X	H	L	H
pin ① of IC14	H	L	H	L

X: don't care

Table 4-1.

3-4-10. Registration Waveform Generator

IC201 is registration IC, the generator of registration waveforms.

Inputs to the IC are AD. HD described above and VD. AD. HD is applied to pin ㉔ as the trigger for H. correction waveform.

Triggering waveforms and corresponding output waveforms are as shown in the next page.

Pins ㉕ and ㉗ are amplitude control terminals for H and V respectively, with input level in 0.5V to 1V range.

In IC201, AGC is applied to SAW waveform generation only. Other waveforms are generated by multipliers based on SAW waveform.

For example, H. PARA = H. SAW × H. SAW
HS × HV = H. SAW × V. SAW
HP × VS = H. SAW × H. SAW × V. SAW

Accordingly, if H. SAW's amplitude decreases to 1/2, then H. PARA amplitude decreases to 1/4 and HP × VS amplitude decreases to 1/8.

IC203 to 207 are amplifiers for amplitude adjustment of waveforms.

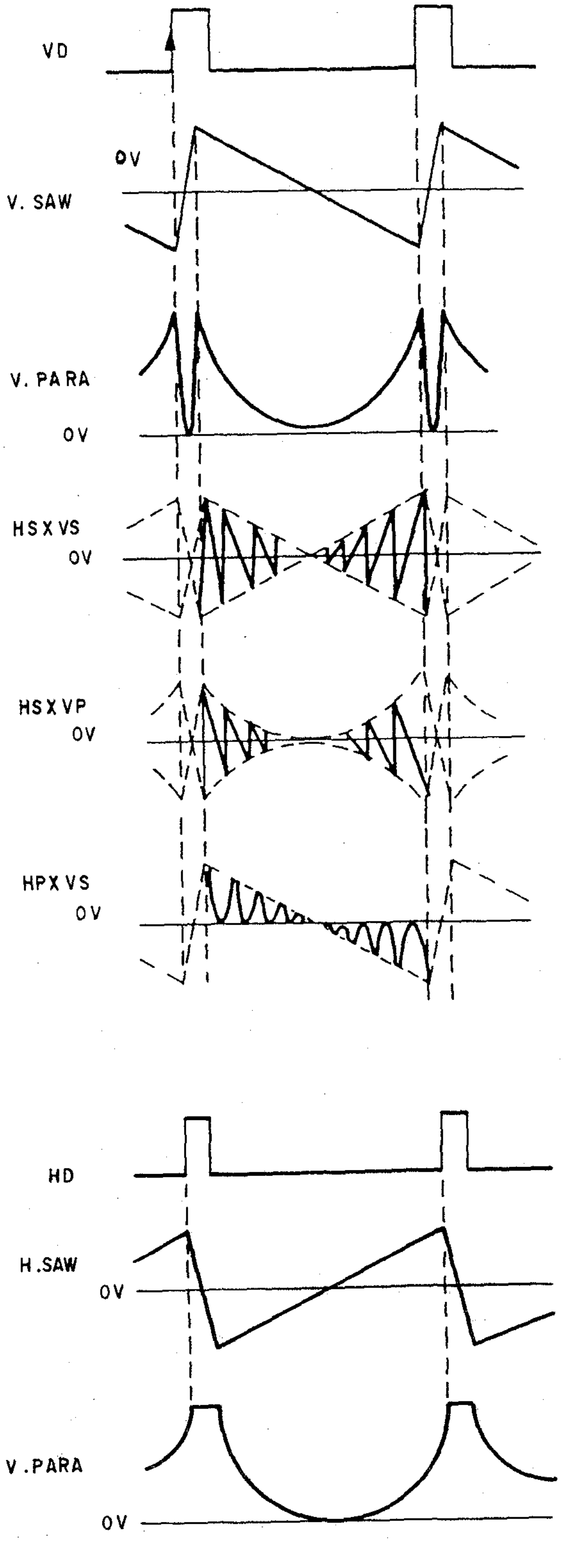


Fig. 4-13.

3-4-11. V. SIN Generator

Using a multiplier (described in "basic circuit (II) on DA board"), multiplication of V. SAW and H. SAW waveforms generated in the registration IC (IC201) is performed to generate V. SIN waveform.

Actually, IC208 and D201 is used to perform half-wave rectification on V. SAW waveform output from pin ⑦ of IC203 to obtain a waveform (D201 K in the diagram) at the cathode of D201. Also, IC209 is used to change the clamping position of V. PARA waveform at pin ① of IC204 to obtain a waveform at pin ① of IC209.

Entering waveforms of D201 K and pin ① of IC209 to "basic circuit (II) on DA board" generates a waveform of Q213 C (see diagram). This waveform is V. SIN 1.

Next, waveform at pin ⑦ of IC203 is applied to Q214 and Q215 to generate a waveform of Q215 E.

Multiplication of waveforms of Q215 E above and that of pin ① of IC209 is done to generate a waveform of Q223 C. This waveform is V. SIN 2.

Dividing V. SIN waveform by switching may cause noises at the dividing point, and results in deflection distortion called "Packman". To avoid this, V. SIN 1 and V. SIN 2 are generated separately from the beginning.

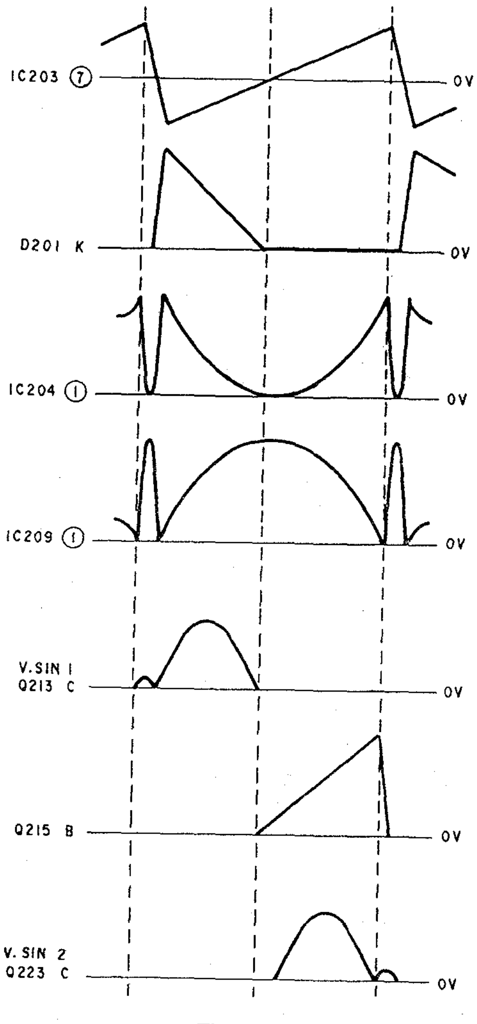


Fig. 4-14

3-4-12. H. SIN Generator

Configuration of H. SIN generator is similar to that of V. SIN generator.

Output of the registration IC (IC201) passes an amplifier (IC207) then full-wave rectification is done in IC211. Output waveform at pin ① of IC211 is as shown in the diagram.

Also, IC212 is used to change the clamping position of H. PARA waveform at pin ① of IC207 to obtain a waveform at pin ① of IC212.

Entering waveforms at pin ① of IC211 and at pin ① of IC212 to a "basic circuit (II) on DA board" generates waveform of Q231 C.

This waveform is applied to IC213, then it is divided in two using 1/2H waveform.

Waveform at pin ⑦ of IC216 is H. SIN 1, and at pin ① of IC216 is H. SIN 1.

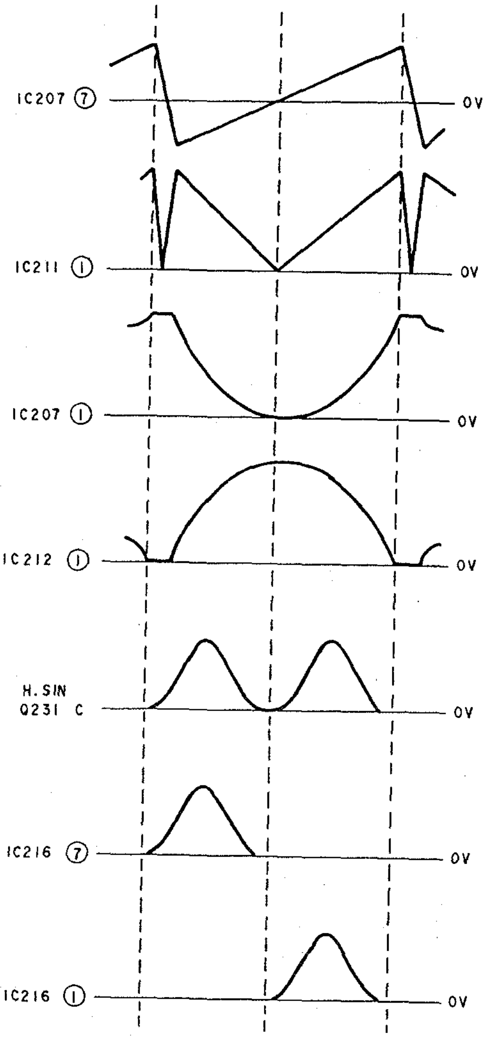


Fig. 4-15

3-4-13. TILT Quartering

TILT waveform is quartered to perform correction on areas A, B, C and D of screen (refer to illustration to the right).

Original waveform is HS × VS (output of pin ⑫ of IC201). This is divided in two (a and b) in IC213 using 1/2H square waveform output from pin ③ of IC201.

Dividing this again using 1/2V square waveform may generate waveforms A, B, C and D. But this technique causes noise with 1% to 2% of amplitude of original signal be superposed at the dividing point. This results in deflection distortion, and adverse effect called "Packman" occurs. (Noise in H direction does not affect deflection distortion.)

To avoid this, a differential emitter follower circuit is used in dividing V component instead of switching circuit. In the circuit of Q232 and Q233, for example, only positive domain of input waveform is output from emitter because one of bases is connected to GND. GND level in the original waveform, however, shifts down by - 0.7V (this corresponds to V_{BE}) in the resultant waveform. V_{BE} of Q233 is used for reversal compensation, and the level restores to GND potential. No switching noise is generated in this circuit, hence no deflection distortion, because it performs no switching operation. This dividing circuit consists of transistors Q232 to Q239.

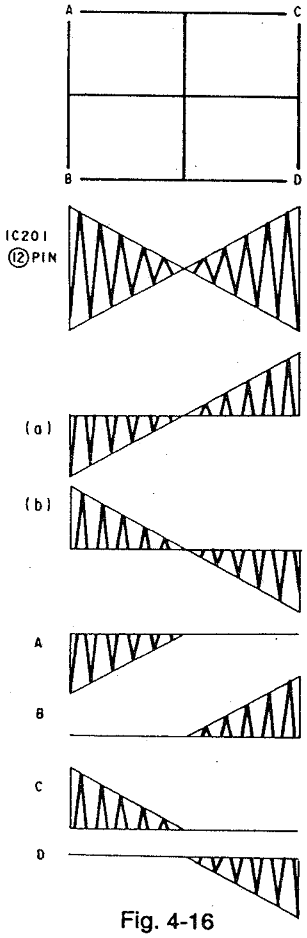


Fig. 4-16

3-4-14. SIZE ABL Circuit

Refer to "basic circuit (II) on DA board".

SIZE ABL circuit is a system shown in diagram to the right. When ABL is activated, voltage at point A is -13.95V since ABL is 3.1mA in this projector set. Voltage at point B is -6.975V when pin ① of IC15 is connected to GND.

Accordingly, ABL is activated if the voltage at point B becomes to -6.975V.

Changing voltage at pin ① of IC601 from GND to negative direction causes the voltage at point B decrease. So, ABL is activated before the voltage at point A reaches to -13.95V (that is, before beam current reaches to 3.1mA).

Decreasing the voltage at pin ① of IC601 in accordance with the decrease in raster size also decreases ABL point accordingly.

H. SIZE data and V. SIZE data are entered to a multiplier ("basic circuit (II) on DA board"). Its output is applied to an operational amplifier (IC601) to decrease the voltage at pin ① of IC601 in accordance with the decrease in raster size.

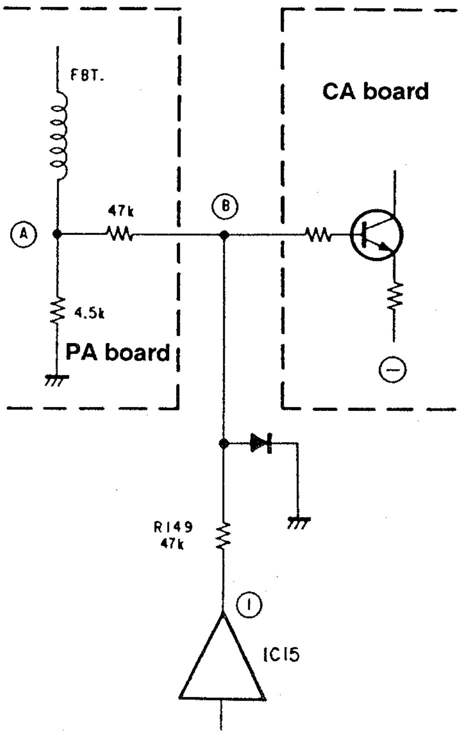


Fig. 4-17

3-5. CIRCUIT OPERATION OF DB BOARD

So far, potentiometers are used in registration controls, user controls, etc. This projector model, however, uses D/A converters in place of potentiometers to cope with remotely-controlled operation.

MB86023 is a D/A converter, and is used as an electronic attenuator with one-input/four-outputs. 36 units of MB86023 are used in this model. Each unit is equipped with 4 channels of output. This enables control to 144 outputs. Channel selection is done using addresses of 8-bit. IC505 to IC510 are address decoders. The D/A converter's resolution is 8-bit.

Description of MB86023

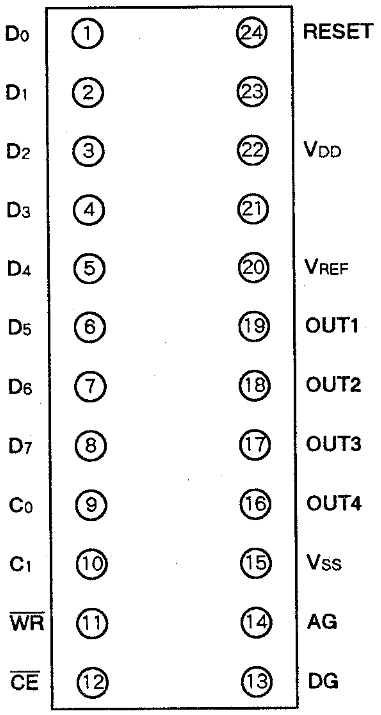


Fig. 5-1.

① to ⑧ ···· DATA inputs: 8-bit parallel input
⑨ to ⑩ ···· Channel Select: Selects/enables one of 4 output
⑪ ··········· LIGHT terminal: After reading data, CPU (Y board) sends a trigger to pull pin ⑪ momentarily down to "L" level. This latches the output.
⑫ ··········· CHIP ENABLE terminal: selects/enables one of 36 D/A converters. It is enabled when this terminal is "L".
⑬ ··········· digital GND
⑭ ··········· analog GND
⑮ ··········· − 5V input
⑯ to ⑲ ·· OUTPUTs
⑳ ·········· Ref. voltage input
㉒ ·········· +5V input

Operation of MB86023

When DC voltage E (v) ($-2.5V < E < 2.5V$) is applied to pin ⑳ (V_{REF}):
For operation of this IC,its pin ⑫ (CE) shall be"L" level. Also, the IC is equipped with 4 outputs. Output selection is done using combination of status on pin ⑨ and pin ⑩ (see the table 5-1.):

	pin⑲	pin⑱	pin⑰	pin⑯
pin ⑨	L	L	H	H
pin ⑩	L	H	L	H

Table 5-1.

If DATA is "FF", then E (V) same with VRef. is output from OUT terminal.
If DATA is "80", then 0 (V) is output from OUT terminal.
If DATA is "00", then -E (V) is output from OUT terminal.
Almost linear change in output level by E/128 (v) per bit occurs with DATA of intermediate value. After reading DATA, a trigger is applied to pin ⑪ (WR) to latch the DATA.

* When AC voltage is applied to V_{REF} terminal:
Operation of the IC is same, that is, output voltage changes in accordance with DATA as shown in Fig. 5-2.

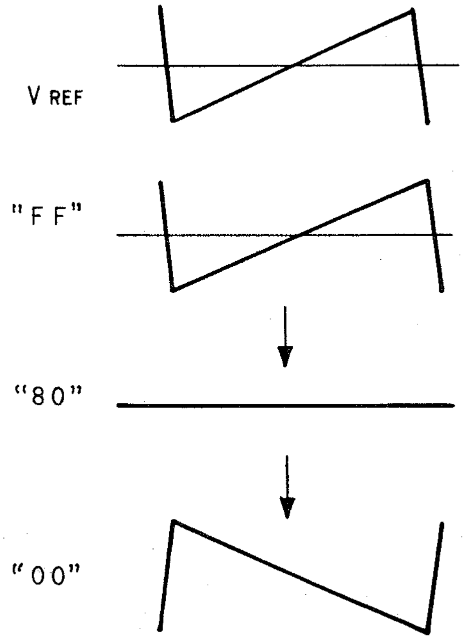


Fig. 5-2.

IC501 to IC504 are buffers, and IC505 to IC510 are address decoders. Table 5-2. shows pin numbers and corresponding output signal of ICs:

IC511	pin ⑲	H. SIZE	IC512	pin ⑲	H. SHIFT	IC513	pin ⑲	H. KEYS
	pin ⑱	H. CENT (G) 1		pin ⑱	H. CENT (G) 2		pin ⑱	H. SKEW (G)
	pin ⑰	H. CENT (R) 1		pin ⑰	H. CENT (R) 2		pin ⑰	H. SKEW (R)
	pin ⑯	H. CENT (B) 1		pin ⑯	H. CENT (B) 2		pin ⑯	H. SKEW (B)
IC514	pin ⑲	H. PIN	IC515	pin ⑲	–	IC516	pin ⑲	H. LIN BIAS
	pin ⑱	H. BOW (G)		pin ⑱	H. SIZE (G)		pin ⑱	H. LIN (G)
	pin ⑰	H. BOW (R)		pin ⑰	H. SIZE (R)		pin ⑰	H. LIN (R)
	pin ⑯	H. BOW (B)		pin ⑯	H. SIZE (B)		pin ⑯	H. LIN (B)
C517	pin ⑲	V. KEYS BIAS (B)	IC518	pin ⑲	–	IC519	pin ⑲	V. SIZE
	pin ⑱	–		pin ⑱	–		pin ⑱	V. CENT (G) 1
	pin ⑰	H. KEYS (R)		pin ⑰	H. PIN (R)		pin ⑰	V. CENT (R) 1
	pin ⑯	H. KEYS (B)		pin ⑯	H. PIN (B)		pin ⑯	V. CENT (B) 1
IC520	pin ⑲	V. SHIFT	IC521	pin ⑲	V. SIZE BIAS	IC522	pin ⑲	V. LIN BIAS
	pin ⑱	V. CENT (G) 2		pin ⑱	V. SIZE (G)		pin ⑱	V. LIN (G)
	pin ⑰	V. CENT (R) 2		pin ⑰	V. SIZE (R)		pin ⑰	V. LIN (R)
	pin ⑯	V. CENT (B) 2		pin ⑯	V. SIZE (B)		pin ⑯	V. LIN (B)
IC523	pin ⑲	–	IC524	pin ⑲	–	IC525	pin ⑲	V. KEYS BIAS (R)
	pin ⑱	V. SKEW (G)		pin ⑱	V. BOW (G)		pin ⑱	V. KEYS (G)
	pin ⑰	V. SKEW (R)		pin ⑰	V. BOW (R)		pin ⑰	V. KEYS (R)
	pin ⑯	V. SKEW (B)		pin ⑯	V. BOW (B)		pin ⑯	V. KEYS (B)
IC526	pin ⑲	–	IC527	pin ⑲	–	IC528	pin ⑲	–
	pin ⑱	V. PIN (G)		pin ⑱	H. ZONE 2 (G)		pin ⑱	H. ZONE 3 (G)
	pin ⑰	V. PIN (R)		pin ⑰	H. ZONE 2 (R)		pin ⑰	H. ZONE 3 (R)
	pin ⑯	V. PIN (B)		pin ⑯	H. ZONE 2 (B)		pin ⑯	H. ZONE 3 (B)
IC529	pin ⑲	H. ZONE 4 BIAS	IC530	pin ⑲	H. ZONE 5 BIAS	IC531	pin ⑲	–
	pin ⑱	H. ZONE 4 (G)		pin ⑱	H. ZONE 5 (G)		pin ⑱	H. ZONE 6 (G)
	pin ⑰	H. ZONE 4 (R)		pin ⑰	H. ZONE 5 (R)		pin ⑰	H. ZONE 6 (R)
	pin ⑯	H. ZONE 4 (B)		pin ⑯	H. ZONE 5 (B)		pin ⑯	H. ZONE 6 (B)
IC532	pin ⑱	H. ZONE 7 (G)	IC533	pin ⑱	H. ZONE 8 (G)	IC534	pin ⑱	H. ZONE 9 (G)
	pin ⑰	H. ZONE 7 (R)		pin ⑰	H. ZONE 8 (R)		pin ⑰	H. ZONE 9 (R)
	pin ⑯	H. ZONE 7 (B)		pin ⑯	H. ZONE 8 (B)		pin ⑯	H. ZONE 9 (B)
IC535	pin ⑱	V. ZONE 2 (G)	IC536	pin ⑱	V. ZONE 3 (G)	IC537	pin ⑱	V. ZONE 4 (G)
	pin ⑰	V. ZONE 2 (R)		pin ⑰	V. ZONE 3 (R)		pin ⑰	V. ZONE 4 (R)
	pin ⑯	V. ZONE 2 (B)		pin ⑯	V. ZONE 3 (B)		pin ⑯	V. ZONE 4 (B)
IC538	pin ⑱	V. ZONE 5 (G)	IC539	pin ⑱	V. ZONE 6 (G)	IC540	pin ⑱	V. ZONE 7 (G)
	pin ⑰	V. ZONE 5 (R)		pin ⑰	V. ZONE 6 (R)		pin ⑰	V. ZONE 7 (R)
	pin ⑯	V. ZONE 5 (B)		pin ⑯	V. ZONE 6 (B)		pin ⑯	V. ZONE 7 (B)
IC541	pin ⑲	–	IC542	pin ⑲	–	IC543	pin ⑲	SHARPNESS
	pin ⑱	H. ZONE 8 (G)		pin ⑱	H. ZONE 9 (G)		pin ⑱	COLOR
	pin ⑰	H. ZONE 8 (R)		pin ⑰	H. ZONE 9 (R)		pin ⑰	HUE
	pin ⑯	H. ZONE 8 (B)		pin ⑯	H. ZONE 9 (B)		pin ⑯	VOLUME
IC544	pin ⑲	DRIVE (G)	IC545	pin ⑲	BACK GROUND (G)	IC546	pin ⑲	BLANKING (T)
	pin ⑱	DRIVE (R)		pin ⑱	BACK GRAUND (R)		pin ⑱	BLANKING (B)
	pin ⑰	DRIVE (B)		pin ⑰	BACK GRAUND (B)		pin ⑰	BLANKING (L)
	pin ⑯	CONTRAST		pin ⑯	BRIGHT		pin ⑯	BLANKING (R)

Table 5-2

3-6. CIRCUIT OPERATION OF DC BOARD

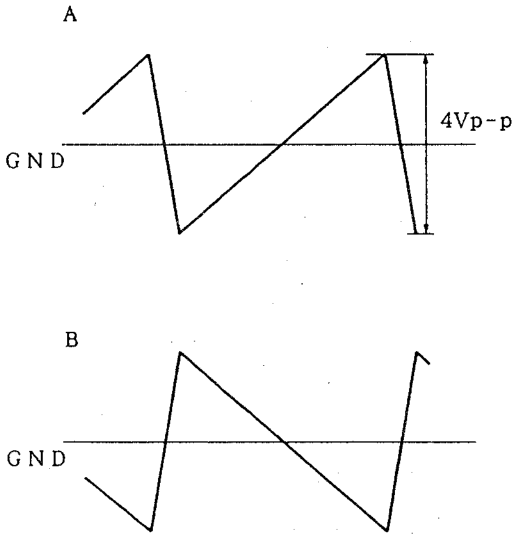
DC board includes two circuit systems:

(1) V. OUT circuit system
(2) H (V) SUB OUT circuit system

These systems include same circuits for R, G, and B channels. Signals generated on DB board enter to DC board. Asynchronous beat noises may occur if impedance mismatching exists on signal lines connecting between DB and DC boards. Study on input/output impedance of these circuit boards was performed to cancel the impedance mismatching, and to decrease the level of asynchronous noises.

3-6-1. V. OUT Circuit System (vertical deflection output)

Vertical deflection output circuit consists of an operational amplifier (μPC4558) and a vertical deflection output IC (μPC1498), and has same circuit configuration in R, G, and B channels. So, circuit of G channel is described here. From DB board, V. OUT waveform (Fig. 6-1-A) enters to pin ③ of connector DC (on DC board). It enters to pin ③ of IC5. Because pin ② of IC-5 is in GND level, a waveform (Fig. 6-1-B) is feedback causing pin ③ of IC5 be kept in GND level. Based on error voltage between pins ② and ③, a waveform (Fig. 6-1-C) is output from pin ① of IC5. This enters to pin ④ of IC6, and current (Fig. 6-1-B) output from pin ② generates a voltage waveform of Fig. 6-1-D. μPC1498 detects error portion in the input waveform (Fig. 6-1-C), and D5 and C10 superpose pulse E to waveform D to generate pulsed power supply.



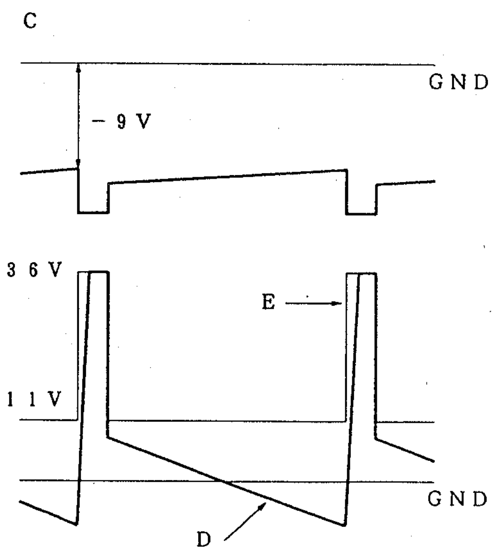


Fig. 6-1.

Q2 performs waveform shaping on deflection output pulse from pin ② of IC6 to monitor deflection output. Without C14, waveform on collector of Q2 will be a pulsed waveform as depicted in Fig. 6-2-A. Actually, integration by C14 is done to generate a sawtooth waveform as shown in Fig. 6-2-B. If something wrong occurred in vertical deflection output, pulses of Fig. 6-1-D do not appear and collector of Q2 is held to +B. This charges the capacitor as shown in Fig. 6-2-B (dotted line), and when the voltage across the capacitor exceeds the reference voltage on pin ⑥ of IC5, then pin ⑦ of IC5 goes up to "H". This turns Q4 ON and turns Q5 OFF. Pin ⑤ of connector DC-3 monitors the stop of vertical deflection. Also, IC9 performs waveform-shaping to deflection output pulse from pin ② of IC6 to output V. PULSE for vertical blanking via D10 and Q6. D9 adds vertical STOP signal to V. PULSE to perform blanking even when vertical deflection stops.

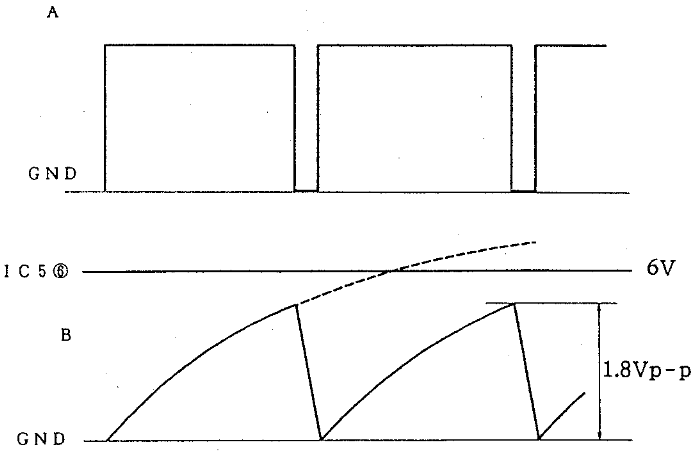


Fig. 6-2

3-6-2. H (V) SUB OUT Circuit System

Both H and V SUB OUT circuits have same configuration in R,G and B channels (6 channels in total). Description on H. SUB OUT (R) is given here.

SUB OUT circuit consists of a pre-amplifier IC302, a drive circuit (Q303and Q306), and a buffer (Q307 and Q308). IC302 is an operational amplifier. Its pin ② is input terminal for correction waveform, and pin ③ is input terminal for current waveform feedback from SUB. DY. Current in SUB. DY is converted into voltage using resistors for current detection (R331 to R336), then enters to pin ③. Let the input voltage to pin ② bev (V). Then, the SUB.

DY current i is calculated as:

$$i = v / 0.78 \text{ (A)}$$

If current amplitude of correction waveform H. SAW is 3 Ap-p, voltage across DY shall be as shown by following equation because retrace time is 2 μS and inductance of DY is 20 μ H:

$$V = \frac{di}{dt} = -20\,(\mu H)\,\frac{3(Ap\text{-}p)}{2(\mu S)} = -30V$$

An operational amplifier is used as pre-amplifier, and Q305 and Q306 are used as drive circuit. Q305 is used as an active load to improve frequency response of drive circuit.

SUB correction shall be proportional to correction waveform input to pin ① of connector DC-3. Beam movement, however, is proportional to integrated waveform because of effect from eddy current in CRT. Reversal correction to the eddy-current effect is done using a differentiating circuit (C301, C343, R301, R302), and amplitude adjustment is done in IC101.

3-6-3. Pulse Power Supply Circuit

Power supply voltage up to 30V is required during retrace time as shown in " (2) SUB OUT circuit". Such a high voltage, however, is not required during scanning time. To reduce power loss, a pulse power supply is used to supply voltage of 30V during retrace time only. This is done by switching ADHD signal from pin ① of connector DC-13 using Q105 and Q108 to generate pulses of ± 35V, then the pulses are added to ± 15V using D102, D103, D105 and D106.

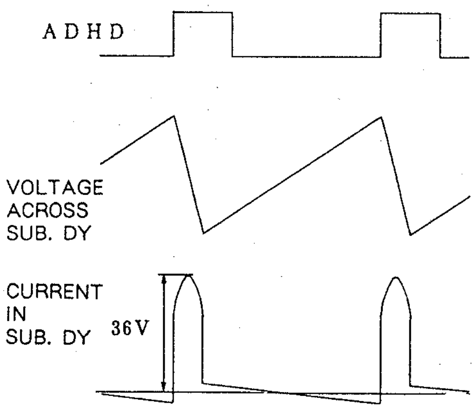


Fig. 6-3

3-6-4. Current Limiter Circuit

CURRENT LIMITERs are used for circuit protection on DC board which are activated at 4A of load current on ± 15V lines. A current limiter on +15V line consists of Q9, R64, and R76. Current flows through a resistor connected to base and emitter, and if the voltage across this resistor exceeds VBE of transistor, then Q9 is turned ON to enable V STOP PROT circuit. Limiter on − 15V line consists of Q10, R65, and R75.

3-7. CIRCUIT OPERATION OF E BOARD

3-7-1. F-V Conversion

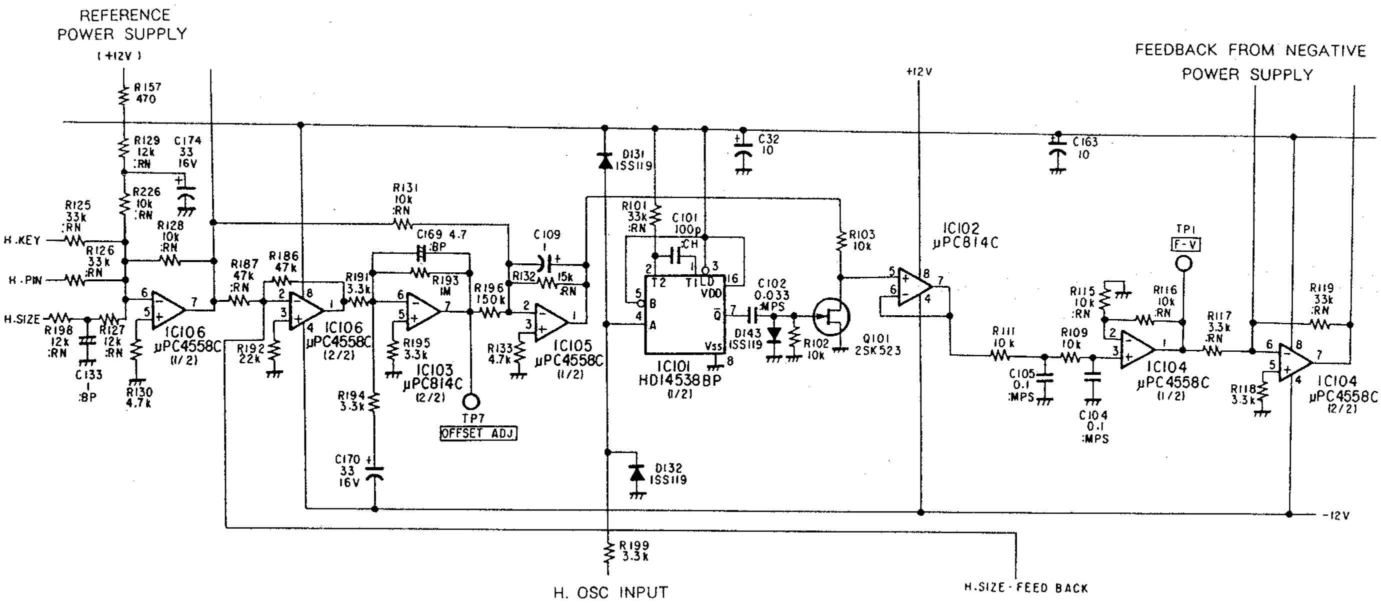

REFERENCE POWER SUPPLY (+12V)
R157 470
R129 12k :RN
C174 33 16V
R226 10k :RN
R125 33k :RN
R128 10k :RN
H.KEY
R126 33k :RN
H·PIN
H.SIZE
R198 12k :RN
R127 12k :RN
C133 1 :BP
R130 4.7k
IC106 μPC4558C (1/2)
R187 47k :RN
R186 47k
R192 22k
IC106 μPC4558C (2/2)
R131 10k :RN
C169 4.7 :BP
R191 3.3k
R193 1M
R195 3.3k
IC103 μPC814C (2/2)
R194 3.3k
C170 33 16V
TP7
OFFSET ADJ
R196 150k
C109 1
R132 15k :RN
R133 4.7k
IC105 μPC4558C (1/2)
D131 1SS119
R101 33k :RN
C101 100p :CH
IC101 HD14538BP (1/2)
D132 1SS119
R199 3.3k
H. OSC INPUT
C32 10
C102 0.033 :MPS
D143 1SS119
R102 10k
R103 10k
Q101 2SK523
+12V
IC102 μPC814C
C163 10
FEEDBACK FROM NEGATIVE POWER SUPPLY
TP1
F-V
R115 10k :RN
R116 10k :RN
R111 10k
R109 10k
C105 0.1 :MPS
C104 0.1 :MPS
IC104 μPC4558C (1/2)
R117 3.3k :RN
R119 33k :RN
R118 3.3k
IC104 μPC4558C (2/2)
-12V
H.SIZE·FEED BACK

Fig. 7-1

H.KEY (V sawtooth wave, about ± 2.5Vp-p), H. PIN (V. PARABOLA wave, about ± 2Vp-p), and H. SIZE (DC, about ± 2.2V) enter to pin ⑥ of IC106 via connector E-1, and they are added together. Also, reference voltage is connected to pin ⑥ of IC106 via R129 and R226. Output from IC106 is distributed to 3 portions of system as shown below:

(1) To pin ② of IC105 via R131

This is the main controller to OPEN LOOP.

(2) To pin ② of IC106 via R187

This is compared to H. SIZE feedback. Error voltage is applied to pin ⑥ of IC103, and is amplified/integrated by R191, R193, and C169, then is output to pin ② of IC105 via R196. This is the controller to error correction in CLOSED LOOP.

(3) To pin ④ of IC107 via C110

This is used as PIN MOD. modulation waveform.

Following paragraphs describe the reason why control (1) and (2) said above are necessary.

Horizontal deflection current varies in accordance with f_H because:

(a) Ratio of H retrace/trace time changes depending on fH, i.e., the higher f_H, the higher PIN MOD voltage is required.

(b) In low f_H, current dissipation increases and voltage drop across R173 and R174 increases beyond ignorable level.

Following curve is derived from (a) and (b):

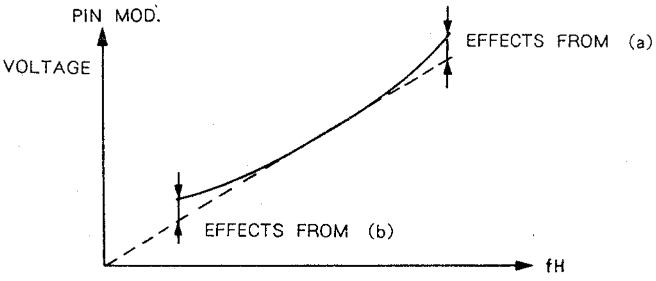


Fig. 7-2

The portion of solid-line shows the curve with constant deflection current. If formed a feedback loop based directly on the concept above to realize this, too large time constant of the feedback loop consisting of negative power supply → PIN MOD. → SIZE detection prevents quick response to sudden change in fH (e.g., signal switching). In practice, feedback operation is limited to correction of errors between dotted lines and solid line in Fig. 7-2, and OPEN LOOP control to portions of dotted line is done using F-V convertor.

Now return to Fig. 7-1. Control both to (1) and (2) are applied to pin⑤ of IC105, then integrated using R132 and C109. DC voltage obtained by integration passes R103, then is switched by Q101. Drive pulse to Q101 comes from DC board. H. OSC pulse enters to pin ④ of IC101 via R199, and after waveform-shaping, it is sent to pin ⑦ of IC101. Waveform on pin ⑦ of IC101 is as shown in Fig. 7-3.

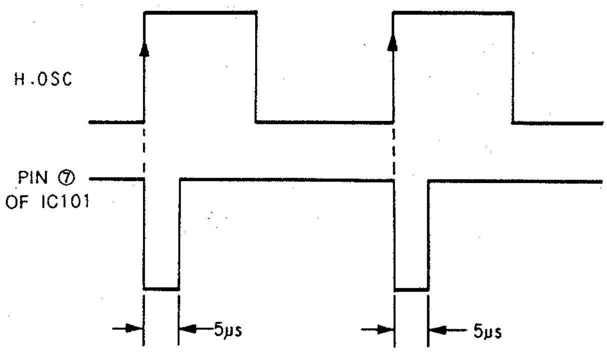


Fig. 7-3

The pulse enters to the gate of Q101 via C102. Pulse, which is proportional to H. SIZE voltage and also to fH, is output from drain of Q101. The pulse passes a buffer (1/2 of IC102), then is integrated by R111, C105, R109, C104, and is output to pin ⑦ of IC104 as F-V conversion voltage. Voltage at TP1 is approximately as shown below:

at f_H = 15 kHz: 0.4V to 0.8V
(with H. SIZE change from min. to max.)
at f_H = 34 kHz: 0.9V to 1.8V
(with H. SIZE change from min. to max.)
at f_H = 75 kHz: 2.3V to 4.3V
(with H. SIZE change from min. to max.)

3-7-2. Negative Voltage Supply

Fig. 7-4 shows the negative power supply.

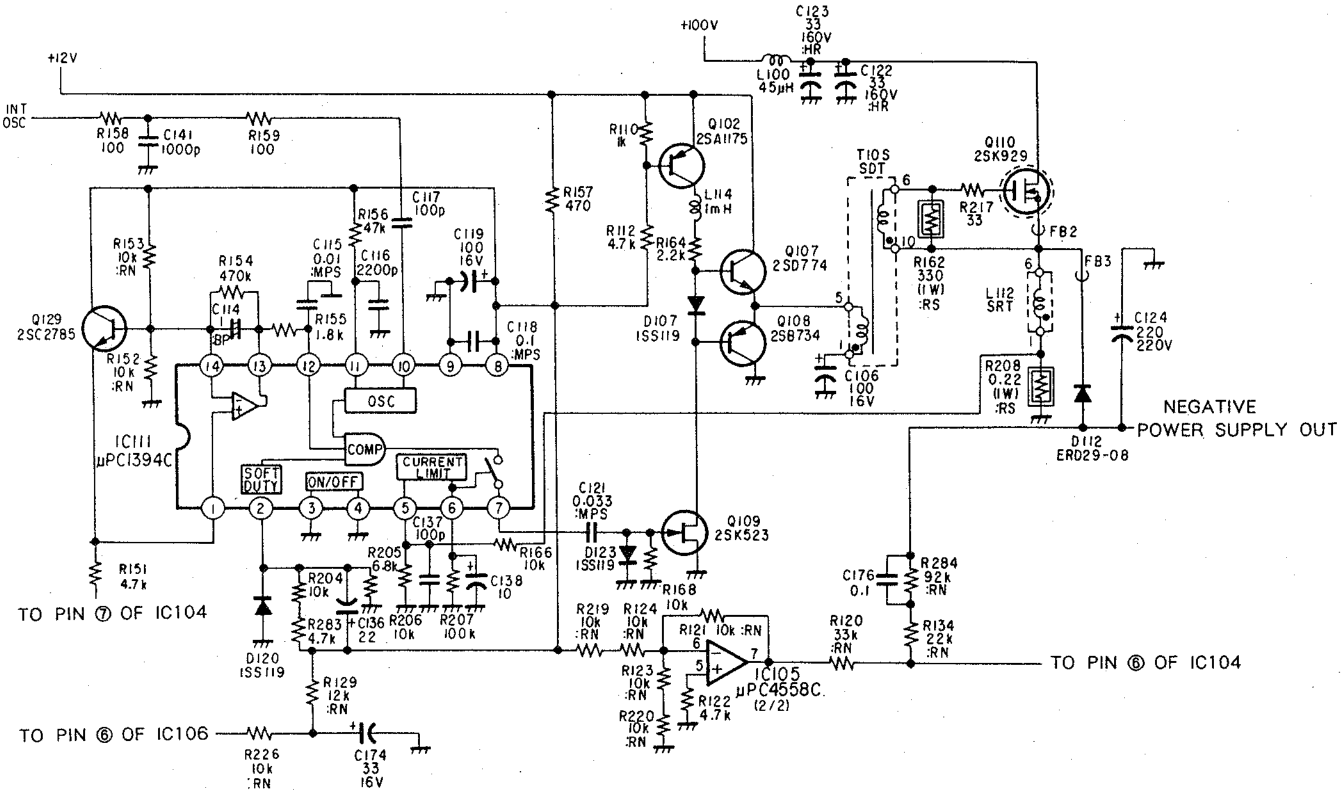

+12V
INT OSC
R158 100
C141 1000p
R159 100
R153 10k :RN
Q129 2SC2785
R152 10k :RN
R154 470k
C114 1 BP
R155 1.8k
C115 0.01 :MPS
C116 2200p
R156 47k
C117 100p
C119 100 16V
C118 0.1 :MPS
OSC
COMP
SOFT DUTY
ON/OFF
CURRENT LIMIT
IC111 μPC1394C
R151 4.7k
TO PIN ⑦ OF IC104
D120 1SS119
R204 10k
R283 4.7k
C136 22
R205 6.8k
R206 10k
R207 100k
C137 100p
C138 10
R129 12k :RN
TO PIN ⑥ OF IC106
R226 10k :RN
C174 33 16V
R157 470
+100V
R110 1k
Q102 2SA1175
L114 1mH
R112 4.7k
R164 2.2k
Q107 2SD774
D107 1SS119
Q108 2SB734
C121 0.033 :MPS
R166 10k
D123 1SS119
Q109 2SK523
R168
R219 10k :RN
R124 10k :RN
R121 10k :RN
R123 10k :RN
R220 10k :RN
R122 4.7k
IC105 μPC4558C (2/2)
C123 33 160V :HR
L100 45μH
C122 33 160V :HR
T105 SDT
Q110 2SK929
R217 33
FB2
R162 330 (1W) :RS
L112 SRT
FB3
C106 100 16V
R208 0.22 (1W) :RS
C124 220 220V
D112 ERD29-08
NEGATIVE POWER SUPPLY OUT
C176 0.1
R284 92k :RN
R120 33k :RN
R134 22k :RN
TO PIN ⑥ OF IC104

Fig. 7-4

Operation is as follows :
Output of F-V convertor enters to pin ⑥ of IC104 via R117 (see Fig. 7-1), and negative power supply is applied to pin ⑥ of IC104 through R284, C176, R134. IC104 compares these inputs, and output voltage from its pin ⑦ enters to pin ① of IC111.

Pin ① of IC111 shall be kept in positive voltage. To achieve this, bias voltage, generated by 2/2 of IC105, is applied to pin ⑥ of IC104. IC111 is a switching regulator IC. Its operation is as follows :
The IC compares voltage on pin ⑭ and on pin ① to output the error between them from pin ⑬ . The output passes a filter (R155 and C115), then enters to pin ⑫ . On the other hand, using INTernal OSC (which enters to pin ⑩) as trigger, a sawtooth waveform synchronous to INT OSC is output from pin ⑪ . Result of comparison between voltage on pin ⑫ and sawtooth waveform on pin ⑪ is output from pin ⑦ .

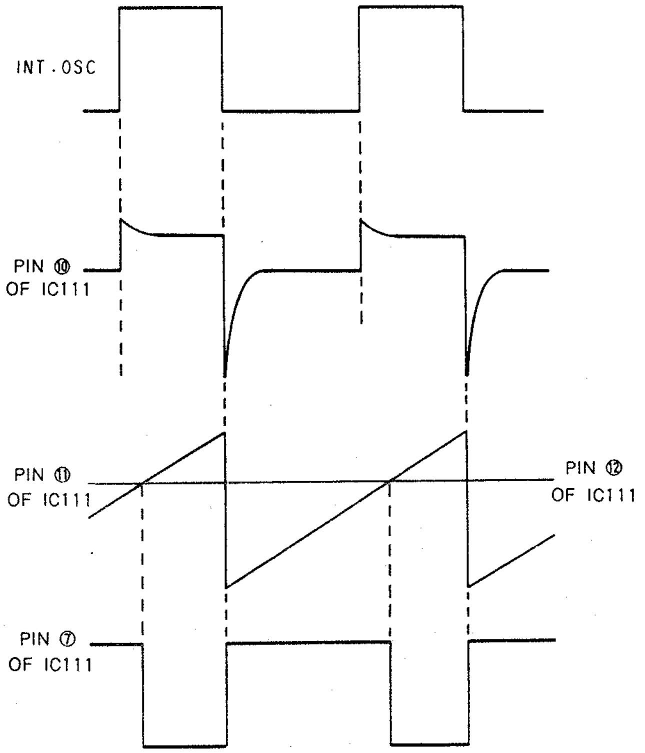


Fig. 7-5

Control to voltage of the negative power supply is done by changing duty on pin ⑦ . The pulse, output from pin ⑦ , is switched by Q109, passes a buffer (Q107 and Q108), then enters to pin ⑤ of T105. The pulse switches Q110 via T105. Q102 stops the switching if voltage on +12V line drops to prevent large fluctuation in output of negative power supply caused by light load at POWER OFF. Q129 prevents pin ① of IC111 from being pulled down to negative domain during POWER ON sequence. R208 is used as current detecting resistor to disable the switching of IC111 OFF at current level about 3-times larger than in normal load.
Basic operation of the inverting-polarity switching regulator is as follows:

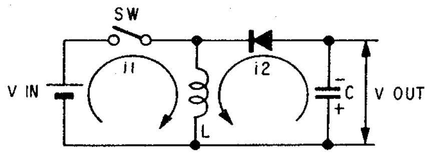


Fig. 7-6

(1) If turned SW ON for an interval (T_{ON}), current i_1 flows through L. Change in current in this case is calculated as

$$\frac{V_{IN} \cdot T_{ON}}{L}$$

(2) If turned SW OFF for an interval (T_{OFF}), then diode turns ON and current i_2 flows through it. Energy stored in L transfers to C. Change in current in this case is calculated as

$$\frac{V_{OUT} \cdot T_{OFF}}{L}$$

(3) In steady state of operation, changes in current of cases (1) and (2) become equal.

$$\frac{V_{IN} \cdot T_{on}}{L} = \frac{V_{OUT} \cdot T_{OFF}}{L} \qquad \therefore V_{OUT} = \frac{T_{ON}}{T_{OFF}} \cdot V_{IN}$$

3-7-3. PIN MOD. Section

Shows PIN MOD section.

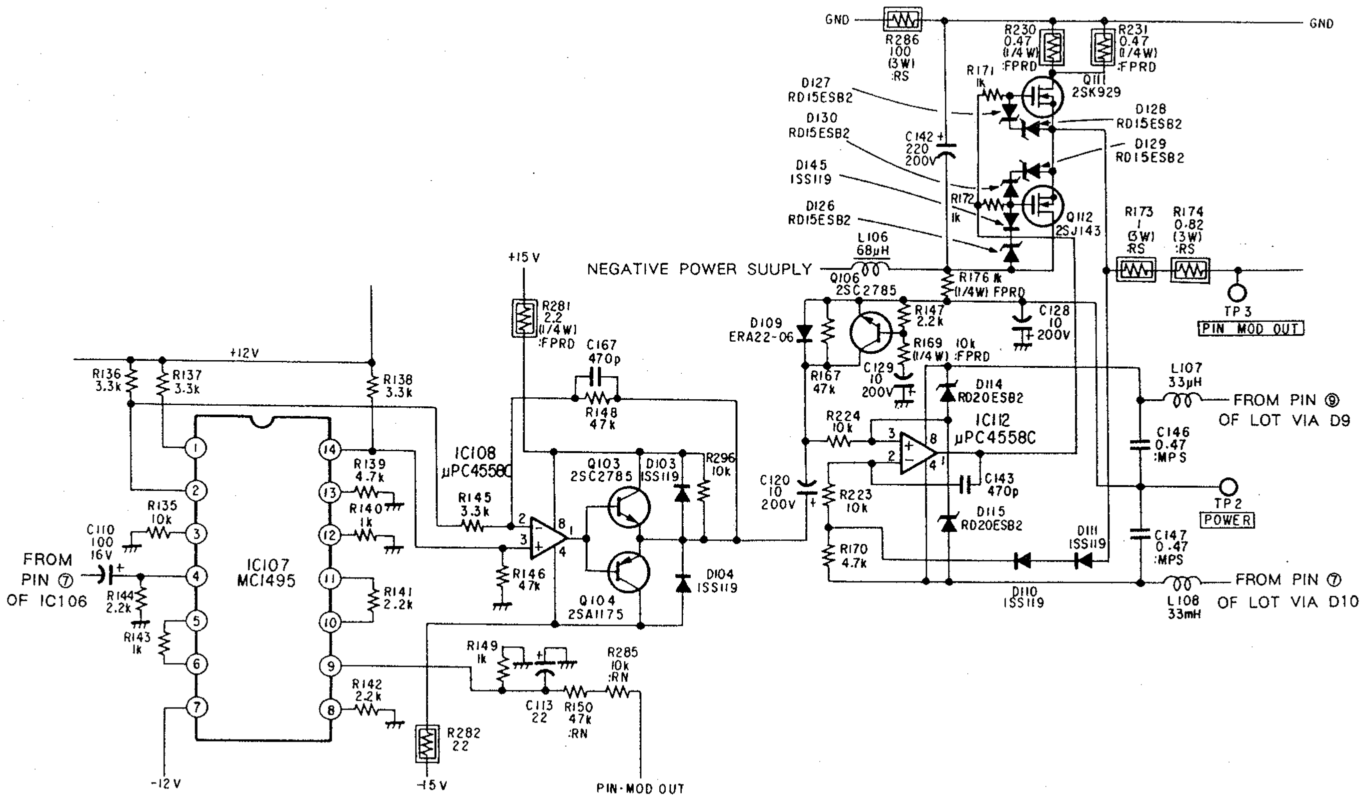
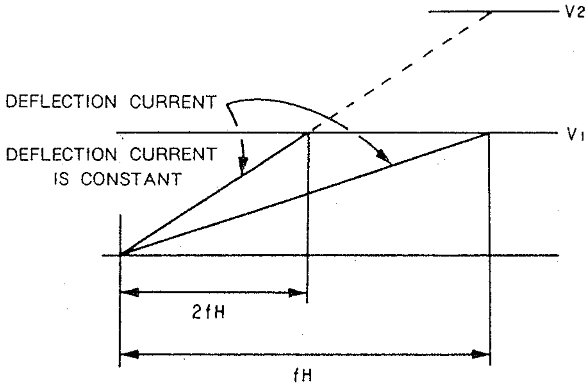

GND
R286 100 (3W) :RS
R230 0.47 (1/4W) :FPRD
R231 0.47 (1/4W) :FPRD
R171 1k
Q111 2SK929
D127 RD15ESB2
D130 RD15ESB2
D128 RD15ESB2
D129 RD15ESB2
C142 220 200V
D145 1SS119
D126 RD15ESB2
R172 1k
Q112 2SJ143
R173 1 (3W) :RS
R174 0.82 (3W) :RS
L106 68μH
NEGATIVE POWER SUUPLY
+15V
Q106 2SC2785
R176 1k (1/4W) FPRD
R147 2.2k
C128 10 200V
D109 ERA22-06
R169 10k (1/4W) :FPRD
TP3
PIN MOD OUT
R281 2.2 (1/4W) :FPRD
C167 470p
R148 47k
C129 10 200V
R167 47k
D114 RD20ESB2
L107 33μH
FROM PIN ⑨ OF LOT VIA D9
+12V
R136 3.3k
R137 3.3k
R138 3.3k
R224 10k
IC112 μPC4558C
C146 0.47 :MPS
IC108 μPC4558C
Q103 2SC2785
D103 1SS119
R296 10k
R139 4.7k
C120 10 200V
C143 470p
R223 10k
TP2
POWER
R135 10k
R140 1k
R145 3.3k
D115 RD20ESB2
C110 100 16V
IC107 MC1495
D111 1SS119
C147 0.47 :MPS
FROM PIN ⑦ OF IC106
R144 2.2k
R141 2.2k
R146 47k
D104 1SS119
R170 4.7k
FROM PIN ⑦ OF LOT VIA D10
Q104 2SA1175
D110 1SS119
L108 33mH
R143 1k
R149 1k
R285 10k :RN
R142 2.2k
C113 22
R150 47k :RN
R282 22
-12V
-15V
PIN-MOD OUT

Fig. 7-7

IC107 is a 4-quadrant multiplier. The reason why a multiplier is used here is to achieve modulation proportional to the change in f_H and in H. SIZE. The concept of this portion is as follows.

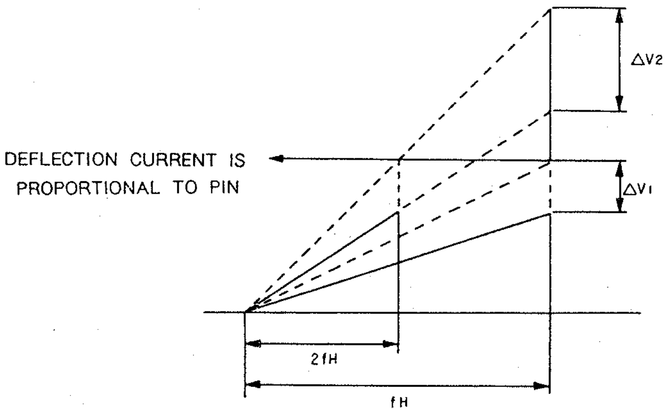

V2
DEFLECTION CURRENT
V1
DEFLECTION CURRENT IS CONSTANT
2fH
fH

$V_2=2V_1$

(deflection current is proportional to PIN MOD. voltage)

Fig. 7-8

As depicted in the illustration above, if f_H increases to $2f_H$, then PIN MOD. voltage 2 times larger than the one at frequency f_H is required to maintain the deflection current constant.



⊿ V2: 2⊿ V1
⊿ V1:modulation voltage

Fig. 7-9

If modulation is ⊿ V1 at fH, then PIN MOD. voltage required at $2f_H$ is ⊿ V2 to maintain the modulation level same with the case of f_H (that is, ⊿ V1), as depicted in the illustration above. To keep the raster size constant, modulation voltage should be changed proportional to f_H and H. SIZE.

Now return to the circuit operation. H. KEY and H. PIN modulation waveforms enter to pin ④ of IC107. Also, PIN MOD. voltage is divided by a resistive divider (R149, R150, R205), then is applied to pin ⑨ . Output from pin ⑭ is proportional to PIN MOD voltage applied to pin ⑨ . IC108 amplifies this voltage, and outputs it through a buffer (Q103 and Q104). C120 cuts DC component from the output, then D109 clamps the waveform to a voltage level from negative power supply. A filter (R176 and C128) is used to eliminate ripple on the negative power supply.

Q106 improves the response of circuit when f_H changes from a low frequency signal to a high frequency signal. Modulation waveform clamped to negative power supply enters to pin ③ of IC112 via R224. IC112 is a buffer. D110 and D119 perform level-shift by $2V_F$ to the clamped waveform. This is done to prevent PIN MOD waveform from being suppressed at its peak.

A ± 10V power supply from LOT, centering at PIN MOD voltage, is used as the power supply for IC112. D114 and D115 prevent IC112 from being latched up at POWER ON sequence. If input voltage exceeds the power supply voltage because of timing between input signal to IC112 and building-up of power supply voltage, latch-up of IC112 may occur.

Modulation waveform, output from pin ① of IC112, enters to gates of Q111 and Q112 via R171 and R172. Q111 and Q112 are FETs for PIN MOD OUT. D126 to D130 are used to protect Q111 and Q112. R173 and R174 are used to prevent returning of parabola voltage across S-shaping capacitor to PIN MOD section. Also, V. retrace time is determined by R173, R174 and S-shaping capacitor. So, the smaller resistance of these resistors, the better.

On the other hand, all current passing these resistors flows into C142. So, resistance of these resistors are determined by maximum ripple current of C142.

3-7-4. H. Drive Section

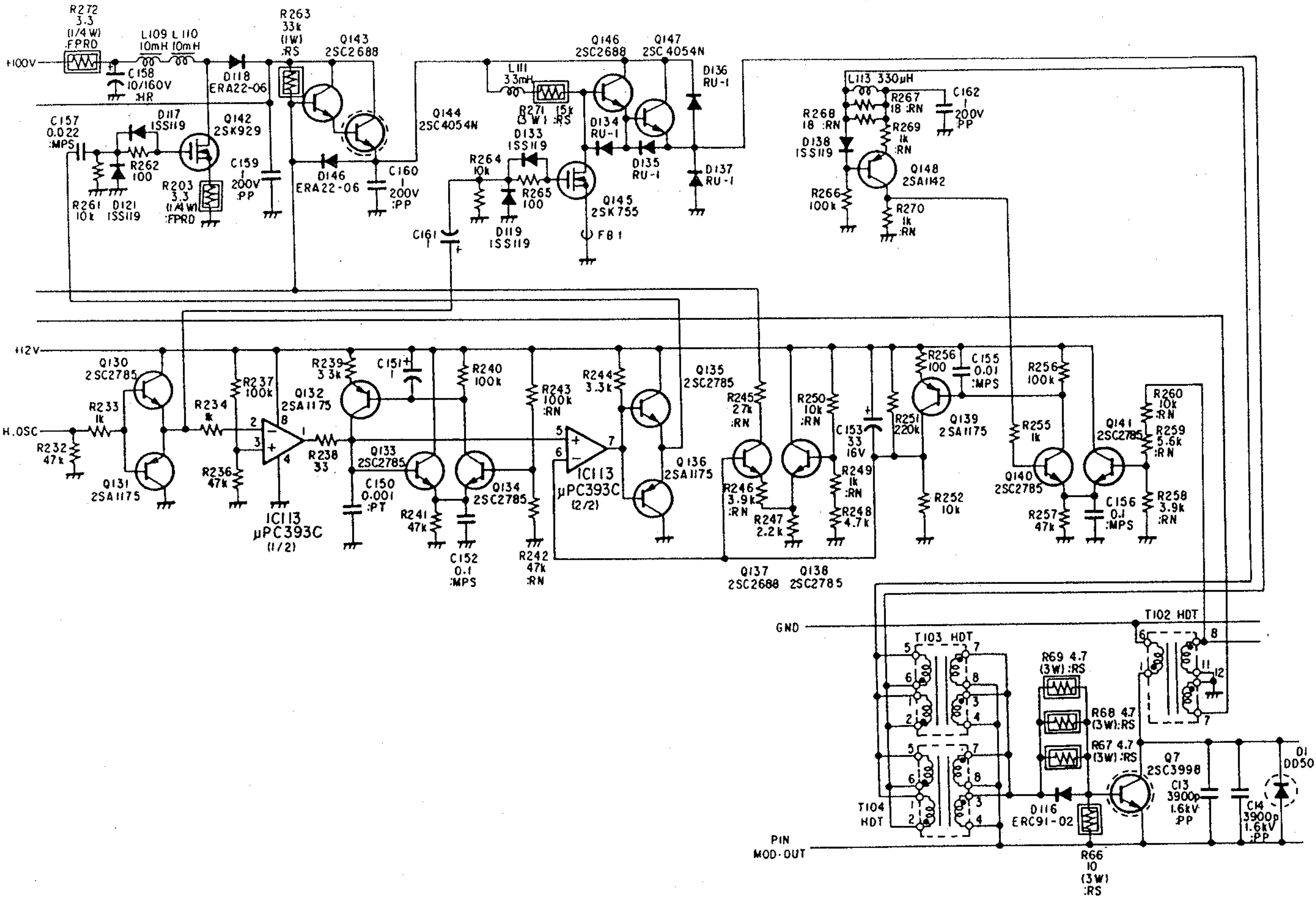

R272 3.3 (1/4W) :FPRD
L109 L110 10mH 10mH
+100V
C158 10/160V :HR
D118 ERA22-06
R263 33k (1W) :RS
Q143 2SC2688
Q146 2SC2688
Q147 2SC4054N
D136 RU-1
L111 33mH
R271 15k (3W) :RS
Q144 2SC4054N
D133 1SS119
Q134 RU-1
D135 RU-1
D137 RU-1
C157 0.022 :MPS
D117 1SS119
Q142 2SK929
R262 100
R203 3.3 (1/4W) :FPRD
C159 1 200V :PP
D146 ERA22-06
C160 1 200V :PP
R261 10k
D121 1SS119
R264 10k
R265 100
Q145 2SK755
F81
C161
D119 1SS119
L113 330μH
R267 18 :RN
R268 18 :RN
C162 1 200V :PP
R269 1k :RN
D138 1SS119
Q148 2SA1142
R266 100k
R270 1k :RN
+12V
Q130 2SC2785
R233 1k
H.OSC
R232 47k
Q131 2SA1175
R237 100k
R234 1k
R236 47k
IC113 μPC393C (1/2)
R239 3.3k
Q132 2SA1175
R238 33
C151 1
C150 0.001 :PT
Q133 2SC2785
Q134 2SC2785
R241 47k
C152 0.1 :MPS
R240 100k
R243 100k :RN
R242 47k :RN
R244 3.3k
IC113 μPC393C (2/2)
Q135 2SC2785
Q136 2SA1175
R245 27k :RN
R246 3.9k :RN
R247 2.2k
R250 10k :RN
Q137 2SC2688
Q138 2SC2785
C153 33 16V
R249 1k :RN
R248 4.7k
R251 220k
R256 100
C155 0.01 :MPS
Q139 2SA1175
R252 10k
R256 100k
R255 1k
Q140 2SC2785
R257 47k
Q141 2SC2785
R260 10k :RN
R259 5.6k :RN
C156 0.1 :MPS
R258 3.9k :RN
GND
T102 HDT
T103 HDT
R69 4.7 (3W) :RS
R68 4.7 (3W) :RS
R67 4.7 (3W) :RS
Q7 2SC3998
C13 3900p 1.6kV :PP
C14 3900p 1.6kV :PP
D1 DD50R
T104 HDT
D116 ERC91-02
PIN MOD-OUT
R66 10 (3W) :RS

Fig. 7-10

Fig. 7-10 shows the circuit diagram of H. Drive section. Topics in this section are:

(a) Variable power-supply for H. Drive
(b) H. Drive circuit (ON-ON type)
(c) Constant IB2 circuit

(a) Variable power-supply for H. drive

A power supply with variable range from 60 volts to one-hundred and several tens volts is required to keep Drive voltage in optimum level while covering change of H. SIZE control setting from minimum to maximum and fluctuation in hfe of H. OUT transistor. Voltage supplied to E board is 100V. A step-up type switching regulator is used to generate voltage higher than 100V.

If drive voltage is less than 100V, a series regulator (Q143, Q144) operates. Control to this series regulator is done by "constant IB2 circuit" to be described later. In this case, Q142 is turned OFF. If drive voltage more than 100V is required, a step-up type switching regulator starts its operation. H. OSC passes R233, then a buffer (Q130, Q131), and enters to pin ② of IC113.

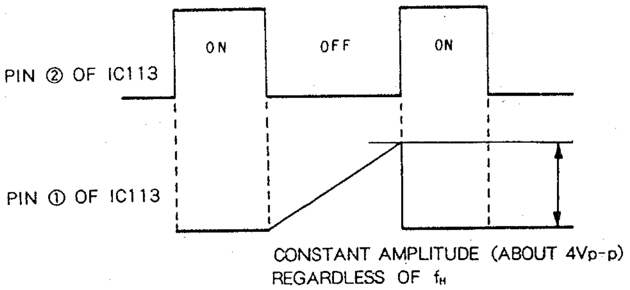


Fig. 7-11

Pin ① of IC113 is held Low, i.e. 0 volt, during ON time said above.
Pin ① of IC113 is OPEN during OFF time said above, and charging to C150 through Q132 occurs. At the next ON time, voltage across C150 quickly discharges through R238. To maintain the amplitude constant, comparison is performed by Q133 and Q134 to control a constant-current source Q132.
Q133 is an emitter-follower, and performs peak-rectification. Q133 also forms a comparator with Q134. The reason why operation of Q133 is deemed as peak-rectifier is, base-emitter junction of Q133 may be deemed as a diode if time constant of R241 and C152 is large enough against input signal.
That is, peak value of Q133's base voltage is compared to the reference voltage applied to Q134's base, and the difference between the two is feedback to Q132's base. Base voltage of Q132 may be deemed as DC because the time constant of R243 and C151 is large enough against input signal. Thus, the peak voltage of Q132's collector is maintained constant.
This output enters to pin ⑤ of IC113. On the other hand, DC voltage output from "constant IB2 circuit" to be described later enters to pin ⑥ of IC113.

Relationship between output waveform from pin ⑦ of IC113 and waveforms on pin ⑤ or pin ⑥ is as shown in Fig. 7-12.

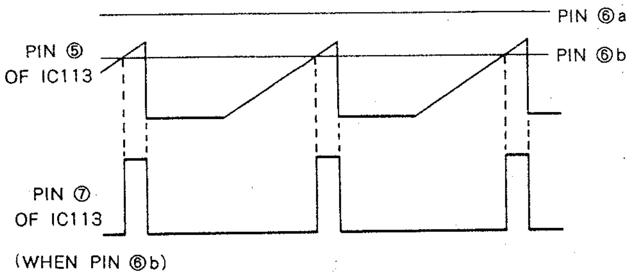


Fig. 7-12

If the voltage on pin ⑥ of IC113 is higher than that of pin ⑤, then pin ⑦ of IC113 is always held Low. When the voltage becomes lower than that of pin ⑤, then pin ⑦ is held High. This output passes a buffer (Q135 and Q136), then enters to the gate of Q142 via C157 and R262. Q142 is the switching regulator FET. At the time of Q142 to start its operation, Q143 and Q144 are fully turned ON. Basic operation of a step-up type switching regulator is as follows:

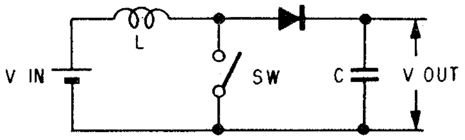


Fig. 7-13

(1) When SW is turned OFF, then Vout = Vin.

(2) If SW is turned ON, energy is stored to L for the time SW is turned ON.

(3) When SW is turned OFF again, energy stored in L is superposed on the input voltage V1.

Following equation shows relationship between parameters said above.

$$V_{OUT} = \frac{T_{ON} + T_{OFF}}{T_{OFF}} V_{IN}$$

That is, voltage higher than 100V may be obtained by control to ON time of Q142. This is used as Drive voltage.

(b) ON-ON type H. drive circuit

H. Drive circuit of this projector model is the one of ON-ON type. If C162 is large enough, then IB1 is maintained constant regardless of changes in fH. ON-ON means following operation of circuit. If current flows in the primary winding of HDT, current flows simultaneously in the secondary winding of HDT, and output transistor is turned ON.
H. OSC passes a buffer (Q130 and Q131), then enters to the gate of Q145. D119 is a clamper, and D133 speeds up the turning OFF of Q145. D134, D135, D136, and D137 are diodes for circuit protection. Timing chart of H. Drive voltage is as shown in Fig. 7-14.

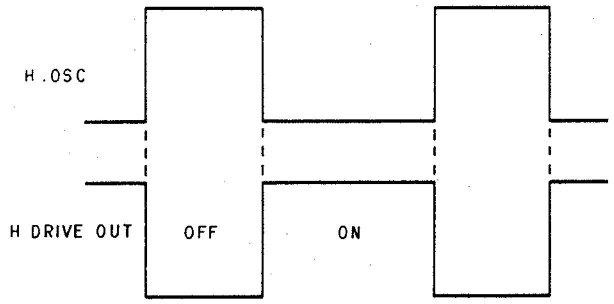


Fig. 7-14

Current flows from Q146 and Q147 during ON time, and Q145 sinks the current during OFF time.

(c) Constant IB2 circuit

Operation of IB2 detector circuit is as follows. In practice, current to be detected flows in secondary windings of T103 and T104. Current in primary windings of T103 and T104, however, is proportional to the the current in secondary windings. So, the current in primary windings of T103 and T014 is detected as IB2. Detection is done by L113, R267 and R268. Let L113 be ignored to simplify the operation.

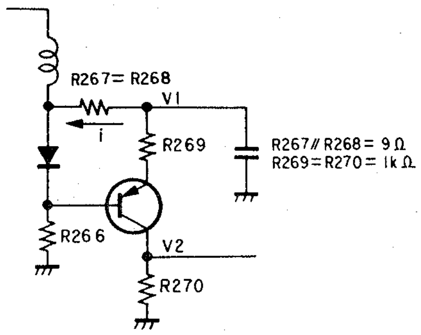


Fig. 7-15

Let voltage and current of circuit be as shown in the circuit diagram. Base voltage of Q148 is given as (V1-ai-0.6), and emitter current of Q148 is given as (v1 - ai). Thus, current in R269 is given as $\frac{9}{1000}$ i, 1000 and the current flows to R270. Thus, V2 is calculated by following equation;

$$V2 = 1000 \times \frac{9}{1000} i = 9i$$

where: R262//R268 = 9 ohms, R269 = R270 = 1k ohms

That is, current proportional to IB2 appears on collector of Q148. D138is used for temperature compensation to VBE of Q148. The reason why L113 is necessary is as follows. Optimum point of IB2 depends on f_H. Insertion of L113 gives the detector a sort of frequency response for correction of optimum point of IB2 depending on f_H

This voltage enters to the base of Q140 via R255. Q140 and Q141 forms a differential amplifier. H. Pulse from the secondary winding of H.O.T is divided by a resistive divider R259, R260 and R258, then enters to the base of Q141. H. Pulse may be deemed that it contains all the fluctuation in H. SIZE and hfe. That is, maintaining IB2 constant by comparation between IB2 and H. Pulse makes the optimum Drive be possible.

For the method of comparison, base-emitter junctions of Q140 and Q141 may be deemed as forward-biased diodes if the time-constant of R257 and C156 is large enough against input signal. That is, the circuit compares the peak DC values of IB2 detect voltage and of H. Pulse. In case of H. Pulse is greater than IB2 detect voltage, circuit operation is as follows: decrease in V_{BE} of Q140 → decrease in collector current of Q140 → increase in base voltage of Q139 → decrease in emitter current of Q139 → decrease in collector voltage of Q139. The output is connected to pin ⑥ of IC113 and to the base of Q137. IC113 (2/2) is the variable power supply control IC for H. Drive. Q137 and Q138 form a differential amplifier, and its operation is as follows: decrease in base voltage of Q137 → decrease in emitter current of Q137 → increase in collector voltage of Q137.

Because collector of Q137 is connected to the bases of Q143 and Q144 (a series voltage regulator) via R245, output from the series voltage regulator increases for Over Drive, hence increase in IB2. In case of H. Pulse < IB2 detect voltage, operation of the circuit is reversed, and results in Under Drive, hence decrease in IB2.

3-7-5. H. SIZE Feed Back, H. SIZE MAX/MIN Protector L.O.T +B line Current Protector

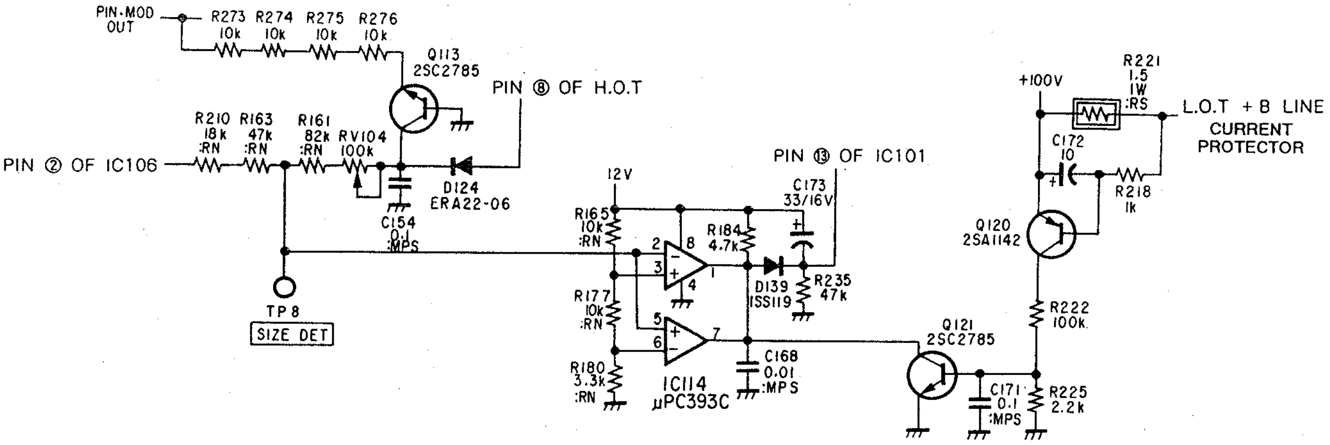

PIN·MOD OUT
R273 10k
R274 10k
R275 10k
R276 10k
Q113 2SC2785
PIN ⑧ OF H.O.T
R210 18k :RN
R163 47k :RN
R161 82k :RN
RV104 100k
PIN ② OF IC106
D124 ERA22-06
C154 0.1 :MPS
TP8
SIZE DET
12V
R165 10k :RN
R177 10k :RN
R180 3.3k :RN
IC114 μPC393C
R184 4.7k
D139 1SS119
R235 47k
C168 0.01 :MPS
PIN ⑬ OF IC101
C173 33/16V
Q121 2SC2785
C171 0.1 :MPS
R225 2.2k
R222 100k
Q120 2SA1142
+100V
R221 1.5 1W :RS
C172 10
R218 1k
L.O.T + B LINE CURRENT PROTECTOR

Fig. 7-16

Fig. 7-16 shows circuits of H. Size Feed Back, H. SIZE MAX/MIN Protector,and L.O.T +B line Current Protector.

In H. Size Feed Back circuit, D124 and C154 performs peak-rectification of H. Pulse from the secondary winding of H.O.T. This DC voltage is returned to pin ② of IC106 as the detection voltage. Operation of Q113 is as follows : Even if amplitude of H. Pulse is constant, mean voltage of peak-rectification differs depending upon f_H.

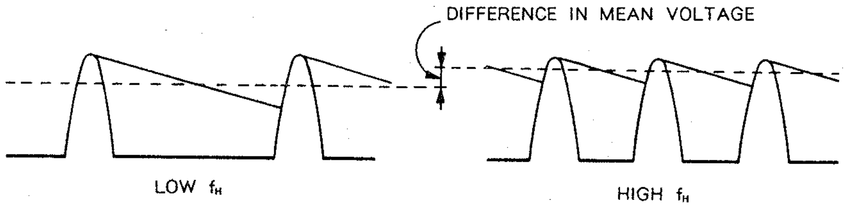

DIFFERENCE IN MEAN VOLTAGE
LOW f_H
HIGH f_H

Fig. 7-17

Long time-constant eliminates difference in mean voltage, however, this deteriorates effectiveness of Feed Back loop. Therefore, control to discharge time in accordance with f_H is used to maintain the mean voltage constant.

That is, discharge time is extended when f_H is low, and is cut short when f_H is high. Emitter of Q113 is connected to PIN MOD. OUT via resistors R273 to R276. Voltage on PIN MOD. OUT is high when f_H is low, and it is low when f_H is high. That is, collector current of Q113 (= discharge current) is calculated by following equation:

$$Ic = \frac{-0.6 - (\text{PIN MOD. OUT})}{\text{R237~R276}}$$

NOTE: PIN MOD. OUT voltage is in negative domain.

As seen from the equation above, the collector current decreases when PIN MOD. OUT is high (smaller absolute value), and the collector current increases when PIN MOD. OUT is low (larger absolute value). Thus, if amplitude of H. Pulse is constant, the mean voltage is maintained constant regardless of fH. The detect voltage is returned to pin ② of IC106 to compare it to input signal. Error component passes IC103 (2/2) and R196, then added to the input signal using IC105 (1/2).

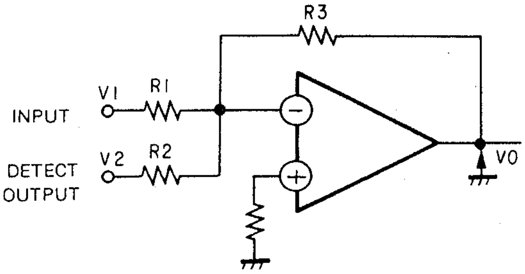

R3
INPUT
V1
R1
DETECT OUTPUT
V2
R2
VO

Fig. 7-18

Equation below shows the relationship between parameters in diagram:

$$Ic = -(\frac{R3}{R1}V1 + \frac{R3}{R2}V2)$$

To simplify the equation, $\frac{R3}{R1}$ and $\frac{R3}{R2}$ may be ignored because they are constants. When |V1|=|V2|, then output Vo is zero with V1 and V2 in reversal polarity. When |V1| ≠ |V2|, then voltage corresponding to |V1|-|V2| appears on output Vo as error voltage. If f_H is low, the error voltage corresponds to power loss in R173 and R174. If f_H is high, the error voltage corresponds to H retrace/trace time.

Operation of H. SIZE MAX/MIN Protector is as follows: IC114 is used to detect H SIZE. Voltage of 6.85V is applied to pin ③ of IC114. Also, voltage of 1.7V is applied to pin ⑥ of IC114. H. SIZE detect voltage is applied to pin ② and pin ⑤ of IC114. When the detect voltage increases over 6.85V (SIZE MAX), or decreases under 1.7V (SIZE MIN), pin ① and pin ⑦ of IC114 fall to LOW state. The output is connected to pin ⑬ of IC101 (in H. STOP circuit to be described later). When pin ① and pin ⑦ of IC101 fall to LOW state, H. STOP circuit is activated to turn the power supply OFF.

Operation of L.O.T +B line Current Protector is as follows:

R221 is the detection resistor. Operating point is set to where Q120 is turned ON, that is,

0.6 = 1.5 × i ∴ i = 400 mA

When Q120 is turned ON, Q121 is also turned ON. Collector of Q120 is connected to the line same with that of pin ① and pin ⑦ of IC114. So,with the operation similar to that of above, the power supply is turned OFF.

3-7-6. HD OUTPUT, H. STOP Circuit

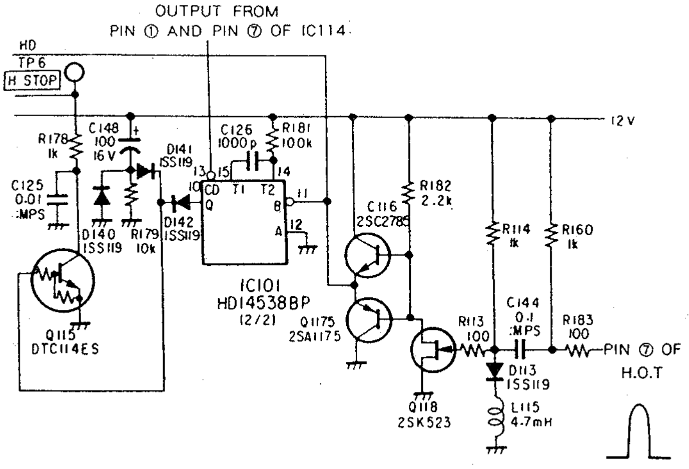

OUTPUT FROM PIN ① AND PIN ⑦ OF IC114
HD
TP6
H STOP
12V
R178 1k
C148 100 16V
D141 1SS119
C126 1000p
R181 100k
C125 0.01 :MPS
D140 1SS119
R179 10k
D142 1SS119
13
15
14
10
CD
T1
T2
Q
B
A
11
12
IC101 HD14538BP (2/2)
Q115 DTC114ES
C116 2SC2785
R182 2.2k
Q1175 2SA1175
Q118 2SK523
R114 1k
R160 1k
R113 100
C144 0.1 :MPS
R183 100
PIN ⑦ OF H.O.T
D113 1SS119
L115 4.7mH

Fig. 7-19

Fig. 7-19 shows HD OUTPUT and H. STOP circuits. Generation of HD output is as follows :

C144 cuts DC component of H. Pulse in negative polarity from pin ⑦ of H.O.T. H. Pulse is biased by R114, D113, and L115. Then,the pulse switches Q118, and is output after passing a buffer (Q116 and Q117). A technique is used to expand the pulse width of HD as far as possible. Because some ringing exists in H. Pulse, spikes may appear at ringing portion if sliced H. Pulse at its base. Decreasing the slice level to eliminate adverse effects from ringing results in narrow pulse width of HD.

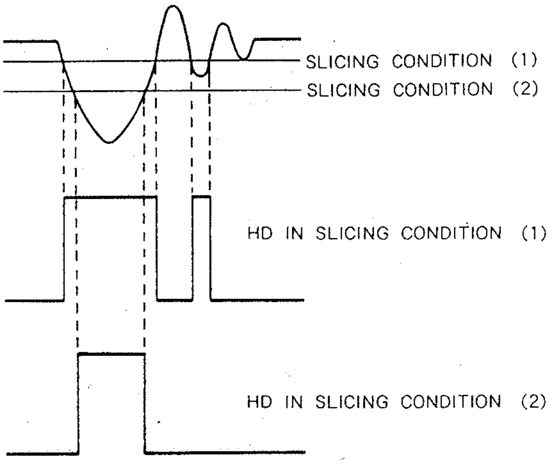


Fig. 7-20

With slicing condition ① , wide HD pulse but with spike.

With slicing condition ② , no spike but narrow HD pulse.

L115 is inserted to generate wide pulse without spike.

Without L, waveform V is clamped to voltage of VF of diode.

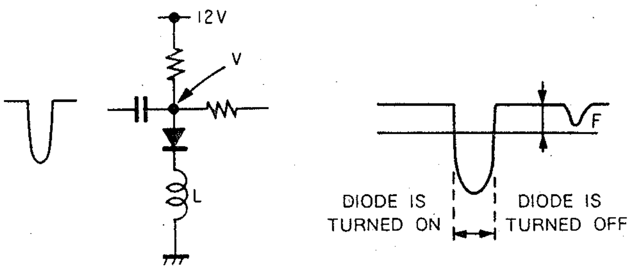

12V
V
L
VF
DIODE IS TURNED ON
DIODE IS TURNED OFF

Fig. 7-21

With L inserted at the cathode of diode, the charge stored in C during OFF time of diode does not discharge quickly in ON time of diode because L impedes the quick discharge. Thus, trailing edge of V pulse is slightly lifted and results in a waveform shown in Fig. 7-22.
That is, wide pulse without spike is obtained by lifting ringing portion of the waveform, and slicing H. Pulse at its base.

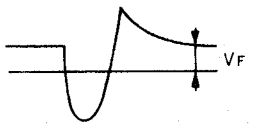


Fig. 7-22

Operation of H. STOP circuit is as follows:
IC101 is a monostable multivibrator. HD enters to B input of the IC. If the time constant of external C,R (100kohms × 1000pF = 100μS, in this case) is long enough than H period, output Q is High as long as HD is applied to B input of the IC. The output enters to the base of Q115 via D142. Thus, Q115 is turned ON in normal state of operation, and H. STOP terminal is LOW. Without HD, Q output falls to LOW and Q115 is turned OFF. This causes H. STOP terminal be High state, and the power supply be turned OFF. Also, output from IC114 is connected to CLEAR terminal of the IC. If SIZE MAX/MIN, L.O.T +B line Current Protector is activated, CLEAR terminal becomes LOW. Q output also falls LOW, and the power supply is turned OFF. C148 is used to keep the base of Q115 High during POWER ON sequence.

3-7-7. L.O.T Section

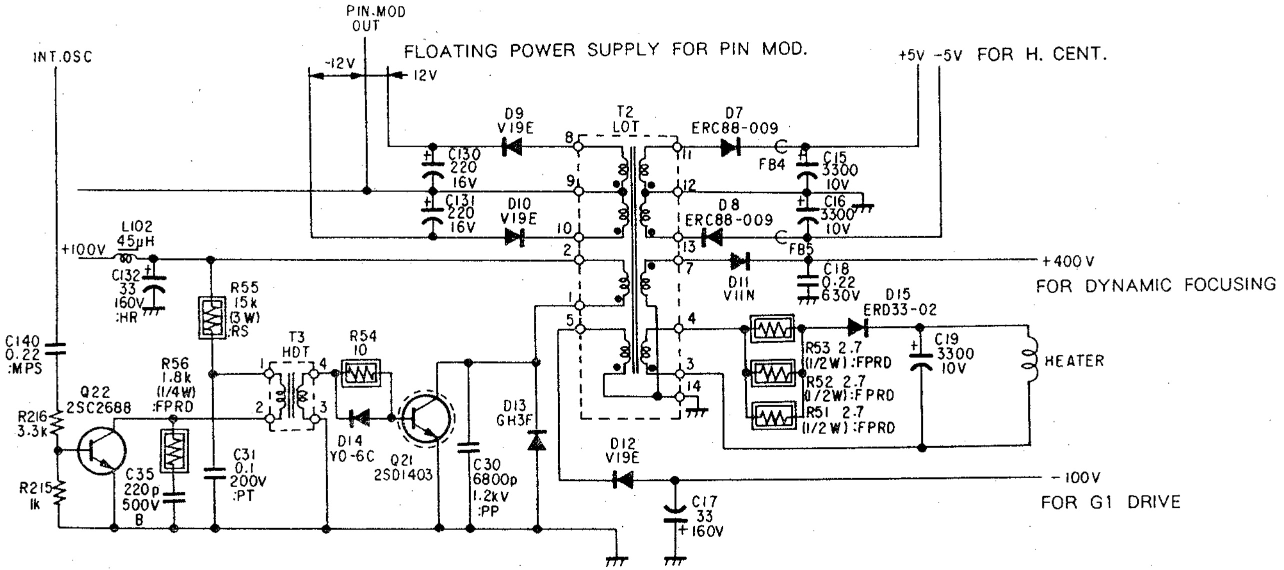

PIN.MOD OUT
INT.OSC
-12V
12V
FLOATING POWER SUPPLY FOR PIN MOD.
+5V -5V FOR H. CENT.
D9 V19E
T2 LOT
D7 ERC88-009
C130 220 16V
C131 220 16V
D10 V19E
FB4
C15 3300 10V
C16 3300 10V
D8 ERC88-009
FB5
L102 45μH
+100V
C132 33 160V :HR
R55 15k (3W) :RS
D11 V11N
C18 0.22 630V
D15 ERD33-02
+400V FOR DYNAMIC FOCUSING
C140 0.22 :MPS
T3 HDT
R54 10
R56 1.8k (1/4W) :FPRD
Q22 2SC2688
R216 3.3k
R215 1k
C35 220p 500V B
C31 0.1 200V :PT
D14 Y0-6C
Q21 2SD1403
C30 6800p 1.2kV :PP
D13 GH3F
R53 2.7 (1/2W) :FPRD
R52 2.7 (1/2W) :FPRD
R51 2.7 (1/2W) :FPRD
C19 3300 10V
HEATER
D12 V19E
C17 33 160V
-100V FOR G1 DRIVE
1
2
3
4
5
7
8
9
10
11
12
13
14

Fig. 7-23

Fig. 7-23 shows L.O.T section.
L.O.T section performs asynchronous operation, as in High Tension section. INT. OSC, generated on PA board, is used as Drive pulse. Q22 is pre-drive transistor, and perform switching to Q21 via T3. Various voltages are provided by resonant pulse determined by inductance L of the primary winding of L.O.T and a capacitor C30.

3-7-8 H. Cent circuit

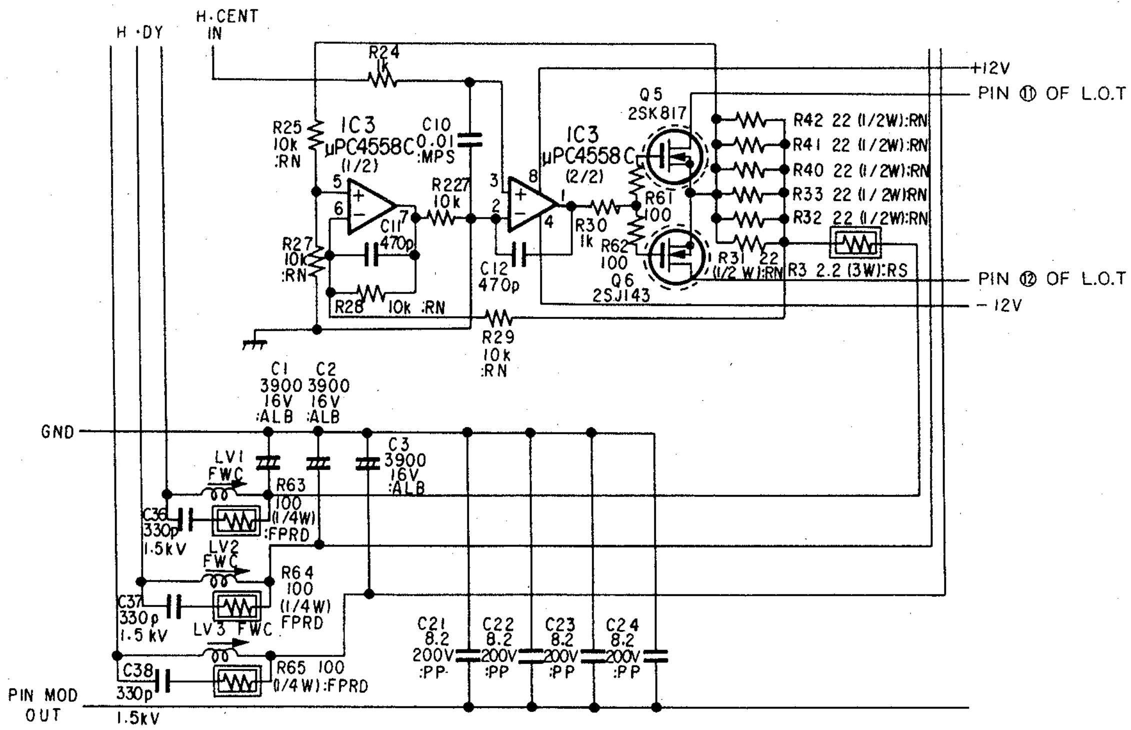

H·DY
H·CENT IN
R24 1k
R25 10k :RN
IC3 µPC4558C (1/2)
C10 0.01 :MPS
R227 10k
C11 470p
R27 10k :RN
R28 10k :RN
C12 470p
R29 10k :RN
IC3 µPC4558C (2/2)
R30 1k
R61 100
R62 100
Q5 2SK817
Q6 2SJ143
R42 22 (1/2W):RN
R41 22 (1/2W):RN
R40 22 (1/2W):RN
R33 22 (1/2W):RN
R32 22 (1/2W):RN
R31 22 (1/2 W):RN
R3 2.2 (3W):RS
+12V
PIN ⑪ OF L.O.T
PIN ⑫ OF L.O.T
− 12V
C1 3900 16V :ALB
C2 3900 16V :ALB
C3 3900 16V :ALB
GND
LV1 FWC
LV2 FWC
LV3 FWC
R63 100 (1/4W) :FPRD
R64 100 (1/4W) FPRD
R65 100 (1/4W):FPRD
C36 330p 1.5kV
C37 330p 1.5 kV
C38 330p 1.5kV
C21 8.2 200V :PP
C22 8.2 200V :PP
C23 8.2 200V :PP
C24 8.2 200V :PP
PIN MOD OUT

Fig. 7-24

Fig. 7-24 shows H. Cent circuit.
Configuration of H. Cent circuits is common in R, G and B channels. So, circuit operation of only one channel is given here.

R31, R32, R33, R40, R41, and R42 are used in detecting H. Cent current. Voltage across these resistors is feedback to IC3 (1/2) to convert H. Cent current into voltage. IC3 (2/2) compares the voltage to H. Cent control voltage to maintain Cent current always constant. C11 and C12 are used to prevent oscillation in the circuit. Q5 and Q6 are DRIVE FETs.

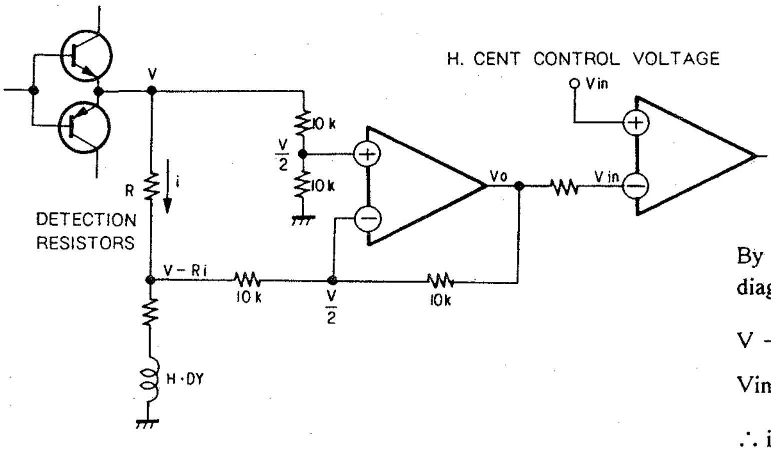

H. CENT CONTROL VOLTAGE
Vin
V
10 k
V/2
10 k
Vo
Vin
R
i
DETECTION RESISTORS
V − Ri
10 k
V/2
10k
H·DY

Fig. 7-25

By setting voltage and current as shown in the circuit diagram, then;

$$V - Ri = \frac{V}{2} = Vo = Vin$$

$$Vin = Ri$$

$$\therefore\ i = \frac{Vin}{R}$$ ·······constant.

3-7-9 H. OUT circuit

Principle of operation of H. OUT circuit is omitted because it is described in detail in various documents. In this model, Q7 is H. OUT transistor, C13 and C14 are resonant capacitors, and D1 is damper diode. The circuit features that PIN. MOD. voltage in negative domain permits H. Cent current flows into H. MAIN DY using no floating power supply. D144, C175, R287 to R290 form a pulse stopper circuit which provides protection to H. OUT transistor be damaged from jumping of collector pulse in case of discharge in high-tension circuits.

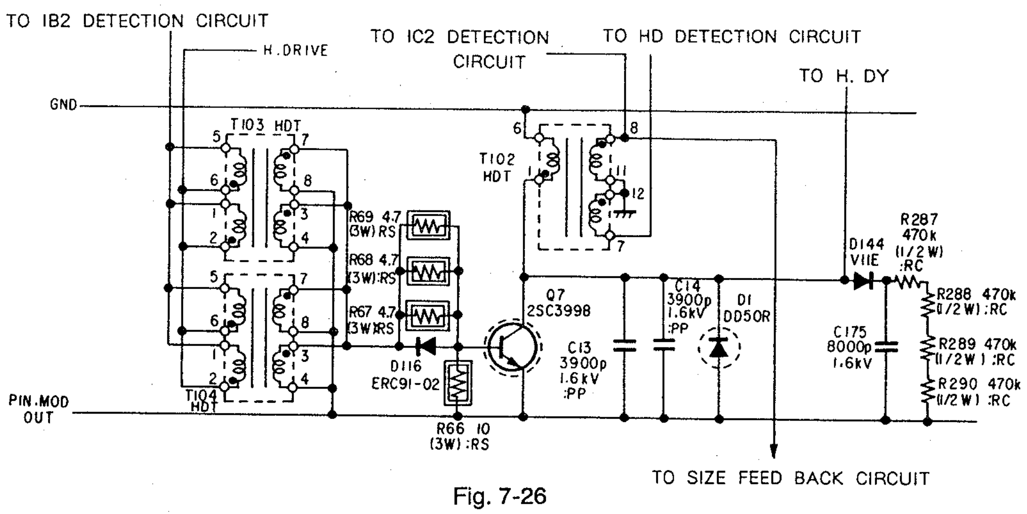

TO IB2 DETECTION CIRCUIT
H.DRIVE
TO IC2 DETECTION CIRCUIT
TO HD DETECTION CIRCUIT
TO H. DY
GND
T103 HDT
T104 HDT
T102 HDT
R69 4.7 (3W):RS
R68 4.7 (3W):RS
R67 4.7 (3W):RS
D116 ERC91-02
R66 10 (3W):RS
Q7 2SC3998
C13 3900p 1.6kV :PP
C14 3900p 1.6kV :PP
D1 DD50R
D144 V11E
C175 8000p 1.6kV
R287 470k (1/2W) :RC
R288 470k (1/2W):RC
R289 470k (1/2W):RC
R290 470k (1/2W):RC
PIN.MOD OUT
TO SIZE FEED BACK CIRCUIT

Fig. 7-26

3-7-10 Block Diagram (E Board)

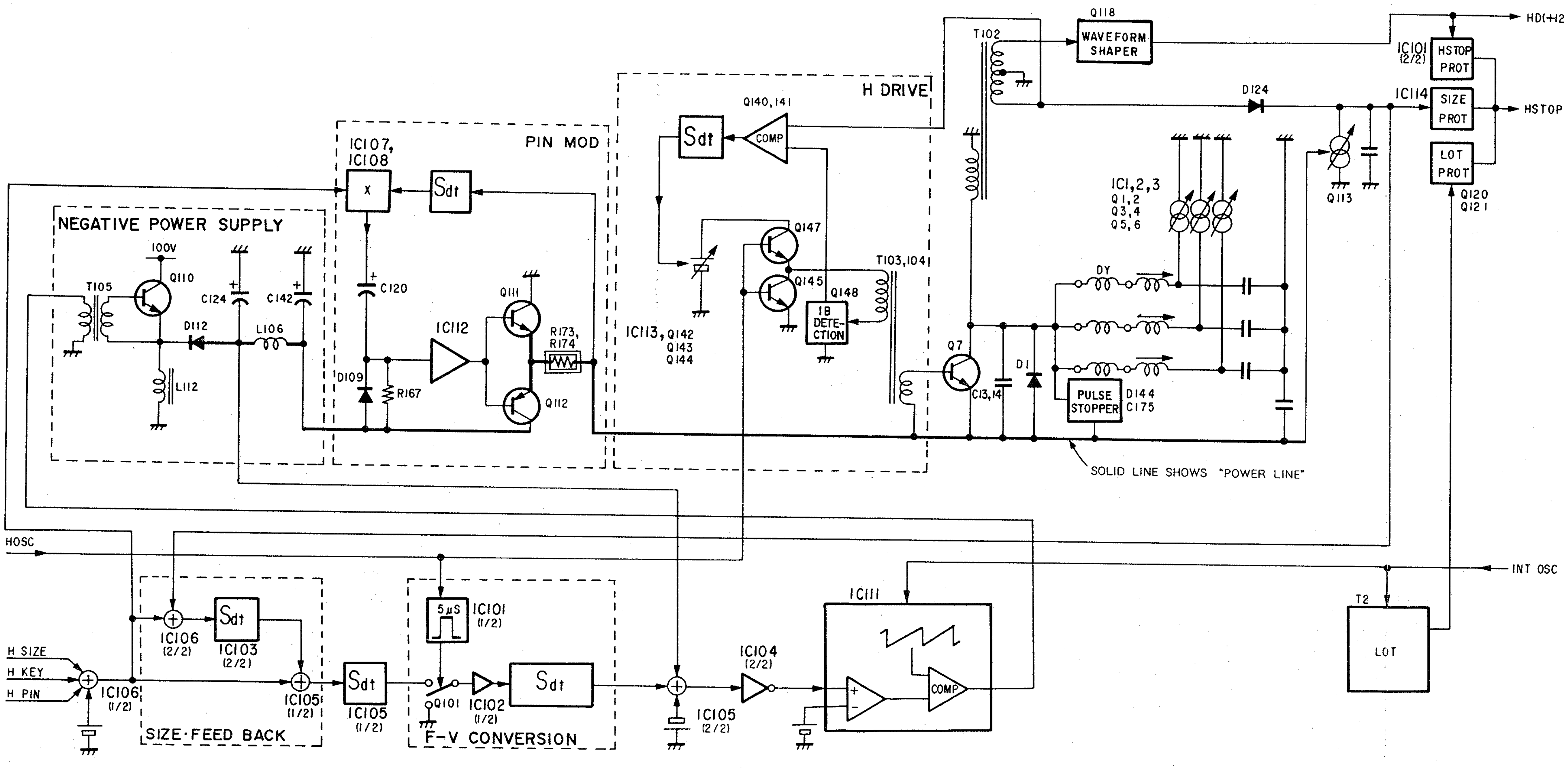

Q118
WAVEFORM SHAPER
T102
HD(+12 V)
IC101 (2/2)
HSTOP PROT
IC114
SIZE PROT
HSTOP
LOT PROT
Q120 Q121
D124
Q113
H DRIVE
Q140,141
Sdt
COMP
PIN MOD
IC107, IC108
X
Sdt
Q147
Q145
Q148
IB DETECTION
T103,104
IC113, Q142 Q143 Q144
NEGATIVE POWER SUPPLY
100V
Q110
T105
C124
C142
D112
L106
L112
C120
IC112
Q111
R173, R174
D109
R167
Q112
IC1,2,3
Q1,2
Q3,4
Q5,6
DY
Q7
D1
C13,14
PULSE STOPPER
D144 C175
SOLID LINE SHOWS "POWER LINE"
HOSC
INT OSC
T2
LOT
IC111
COMP
H SIZE
H KEY
H PIN
IC106 (1/2)
IC106 (2/2)
Sdt
IC103 (2/2)
IC105 (1/2)
SIZE·FEED BACK
Sdt
IC105 (1/2)
5μS
IC101 (1/2)
Q101
IC102 (1/2)
Sdt
F-V CONVERSION
IC105 (2/2)
IC104 (2/2)

Fig. 7-27

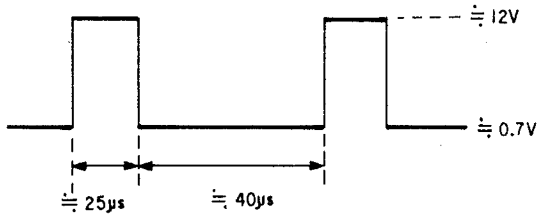
3-8. CIRCUIT OPERATION OF PA BOARD

3-8-1. Internal OSC.

This projector set is designed to operate in wide-range, multi-scanning modes. In such case, configuration of conventional high-tension circuit synchronous to fH is difficult. So, an asynchronous type high-tension circuit configuration driven by an independent oscillator is adopted.

A resonator X1 is the fundamental clock of oscillator which oscillates at 495kHz. The clock frequency is divided by IC7 and IC8 to generate pulses about 15.47 kHz as "internal oscillator" (INT. OSC.). Pin ⑧ of IC8 is output terminal of INT. OSC. INT. OSC. is used as switching pulse in two circuits. One is sent to high-tension circuit via a buffer (Q3), and the other passes a buffer (Q4) and a connector (PA-3), then sent to E board as switching pulse for a negative power-supply.

R96, R97 and C47 connected to pin ⑪ (RESET terminal) of IC7 form a reset circuit at power-on. It differentiates voltage building-up waveform at power-on sequence so that INT. OSC. is output after complete building-up of the power supply voltage.



(EMITTER OUTPUT FROM Q4)

Fig. 8-1. INT. OSC. pulse

3-8-2. HV Generator

INT. OSC. pulse passes a buffer (Q3), pin ③ and pin ④ of connector PA-7,then drives transistor Q6 (2SC2688). Q6 drives a drive transformer T2, and output of T2 drives Q10 (2SD1887, converter transistor of FBT). Basic portion of this high-tension circuit is same with that of conventional high-tension circuits. Q10 is converter transistor; D20 and D21 are damper diodes; C51 is resonant capacitor; L3 and L4 are dummy inductors; and C54 is S-shaping capacitor.

Inductance of dummy inductors (L3 and L4) is selected about 2.1 mH, and this is roughly equal to the inductance of primary winding of FBT. In this projector set, two FBTs are connected in parallel to achieve high power output. So, the inductance as seen from collector of transistor Q10 is about 0.525 mH (four inductors of 2.1 mH are connected in parallel). A high-tension circuit utilizes LC resonance of this inductance and resonant capacitor (C51) to generate high voltage. It generates pulses (about 1kV) in the primary winding of FBT, and these pulses are stepped up by several tens times in the secondary winding of FBT. Pulse hight in the primary winding Vp is determined by equivalent inductance (0.525 mH) of dummy inductors, resonant capacitor, power supply voltage connected to dummy inductors (V_{+B}), and frequency of drive pulse (f_H):

$$Vp = \frac{V_{+B}(1/f_H - Tw)}{2\sqrt{LC}}$$

$$\text{where: } Tw = \frac{1}{\pi\sqrt{LC}}$$

Tw: resonant pulse width

Strictly speaking, equations above is not effected in practice because of various factors. Values at cut-off of CRT's beam current are;

$V_{+B} \fallingdotseq 110V$, $Vp \fallingdotseq 800V$, $Tw \fallingdotseq 12\mu S$

Ratio of FBT's primary and secondary windings is about 40. Pulse with height about 40 times (33kVp-p) of primary pulse is output from the secondary winding.

This is rectified by diodes built in FBT, a HVF (HV filter), and a capacitor built in HVB (HV block), and is output as DC voltage of 33kV.

Because high voltage in this projector set is generated by asynchronous circuits, picture may be adversely affected by ripple component in high voltage. To avoid this, high voltage generated in FBT passes a filter (HVF) first, then is applied to high voltage detection circuit and to a HVB for high voltage distribution to CRTs.

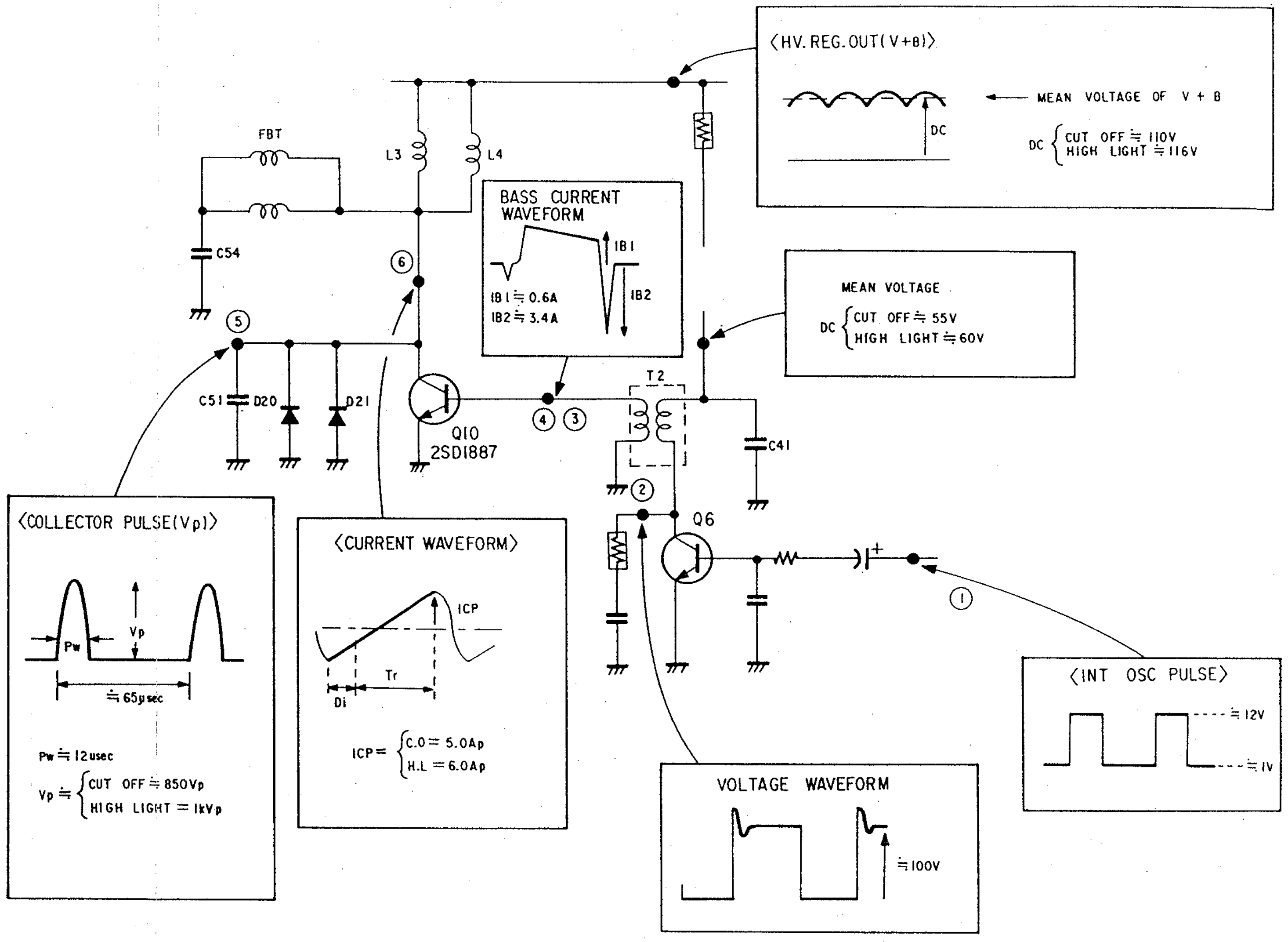


Fig. 8-2. Simplified circuit diagram (HV generator).

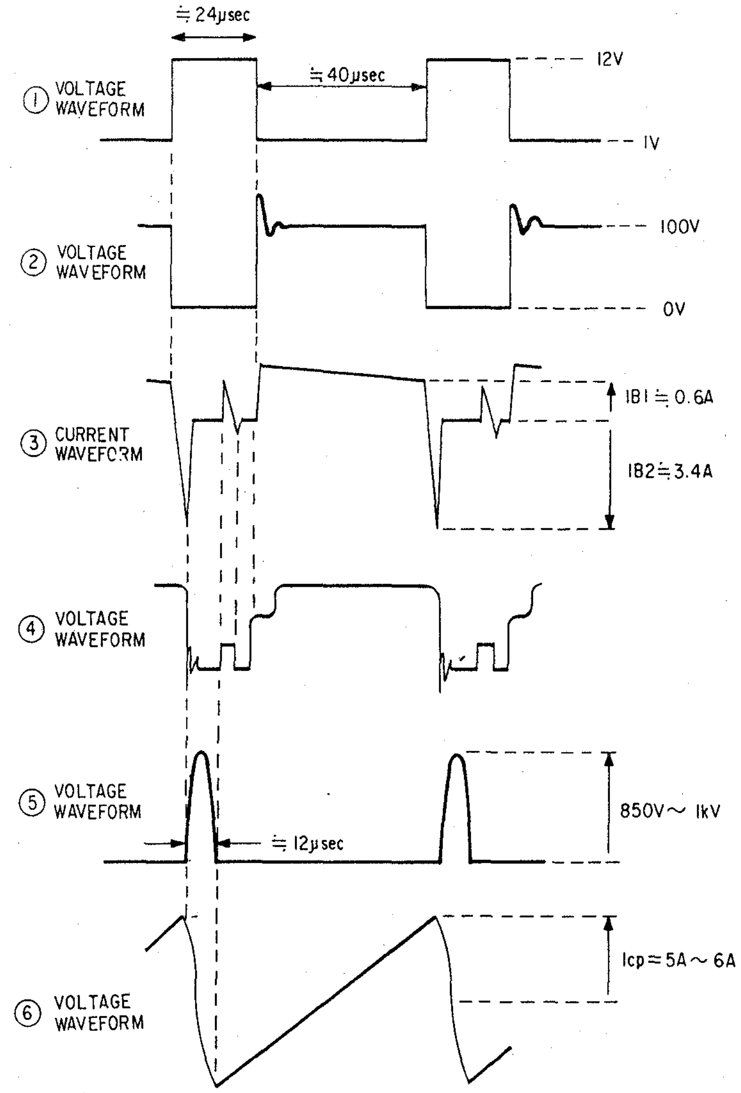


Fig. 8-3. Major waveform (HV generator).

3-8-3. HV Regulator

High voltage generation is done by rectifying pulses generated in the secondary winding of FBT using diodes and a capacitor. Regulation of this high-voltage, however, is poor because of its circuit configuration. That is, the heavier HV load (beam current increases), the less high-voltage.

Beam current increases → Ripple in HV increases → Mean HV drops.

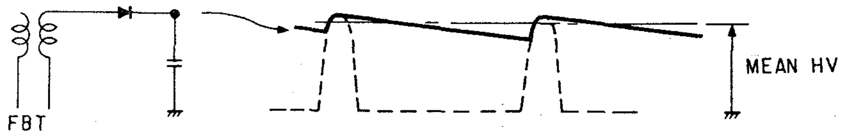


Fig. 8-4

Even with heavy load, you can achieve high mean HV by increasing pulse height in the secondary winding. FBT is a simple step-up transformer. The higher primary pulse height, the higher secondary pulse height. Configuration of HV regulator is as follows: It detects mean HV with a method available, and controls FBT's primary pulse height to maintain mean HV constant regardless of change in HV load.

Now let's consider how to control the primary pulse height. As described in preceding 3-10-2. HV Generator] section, pulse height Vp is calculated by following equation:

$$V_p = \frac{V_{+B}\,(1/f_H - T_W)}{2\sqrt{LC}}$$

The equation shows that Vp also affected by power supply voltage (V_{+B}). In this projector, a step-up type switching regulator is used to step-up +100V to V_{+B}. Control to the pulse height Vp is done by control to V_{+B} (that is, control to portion of stepped up).

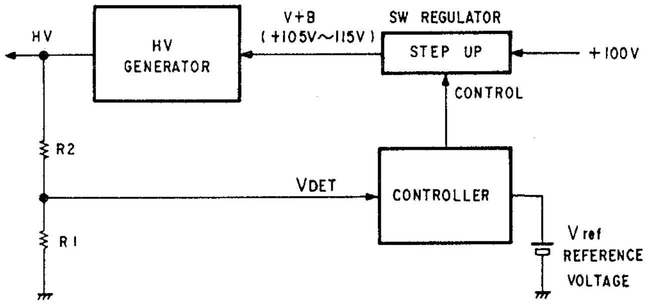


Fig. 8-5. Basic configuration of HV regulator

The system controls stepped up portion from +100V to keep V_{DET} to V_{REF} (reference voltage).

a) Switching regulator

Fig. 8-6 shows basic configuration of switching regulator.

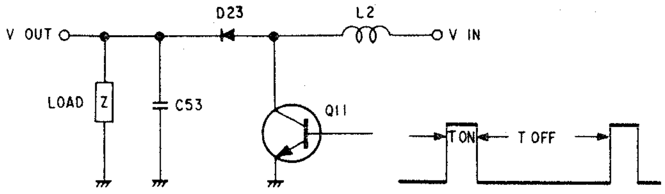


Fig. 8-6

Q11 is switching transistor. Step-up of input voltage (V_{IN}) is achieved by periodically turning Q11 ON and OFF. In this case, output voltage (Vout) is calculated by following equation:

$$V_{OUT} = \frac{T_{ON} + T_{OFF}}{T_{OFF}} V_{IN}$$

As you can see from the equation above, step-up voltage Δ V (i.e., $V_{OUT} - V_{IN}$) by the switching regulator is determined by Q11's switching duty (ratio between Ton and Toff).

Operation of switching regulator is as follows:

Part numbers shown in following paragraphs correspond to the ones used in this switching regulator.

ON-OFF pulse (square wave) which determines the step-up portion (Δ V) is output from pin ⑦ of IC6 (μPC1394C) in negative polarity. The output pulse passes a buffer (Q20), then turns transistor Q5 ON and OFF. Q5 drives the primary winding of drive transformer T1, and the output pulse from T1's secondary winding turns the switching transistor Q11 ON and OFF. Polarity of pulse is inverted in T1.

b) HV detection circuit, and control circuit to switching regulator

Following sequence shows the simplified HV control derived from preceding description:

HV control ← control to FBT's secondary pulse height ← control to FBT's primary pulse height ← control to V+B ← control to Δ V from switching regulator ← control to Duty of switching

That is, duty (ratio between T_{ON} and T_{OFF}) of switching pulse which controls the switching regulator determines the control to HV.

Now let's consider the outline of how to generate this switching pulse (and control to its duty). Fig. 8-7 shows its simplified circuit diagram.

First, HV is divided by high resistors to obtain a low level (about 8V) of voltage. The voltage passes a buffer and a resistive divider to obtain a final voltage level of about 3V. This is HV detect voltage. The HV detect voltage enters to non-inverting input (pin ① of IC6) of an operational amplifier. The operational amplifier forms a non-inverting amplifier, and its reference voltage V_{REF} is set to 3V. That is, HV is divided to about 3V (HV detect voltage), and the non-inverting amplifiers used to detect the error between HV detect voltage and the reference voltage (V_{REF} =3V). Amplitude of this error voltage is determined by R129 and R58 which determines DC gain of the amplifier, and appears on output terminal (pin ⑬ of IC6) of the amplifier. The error voltage enters to positive input of a comparator. On the other hand, a sawtooth waveform with some period enters to negative input of the comparator. This causes comparator's output to be square wave with constant period. The output pulse is used as the switching pulse to control the switching regulator.

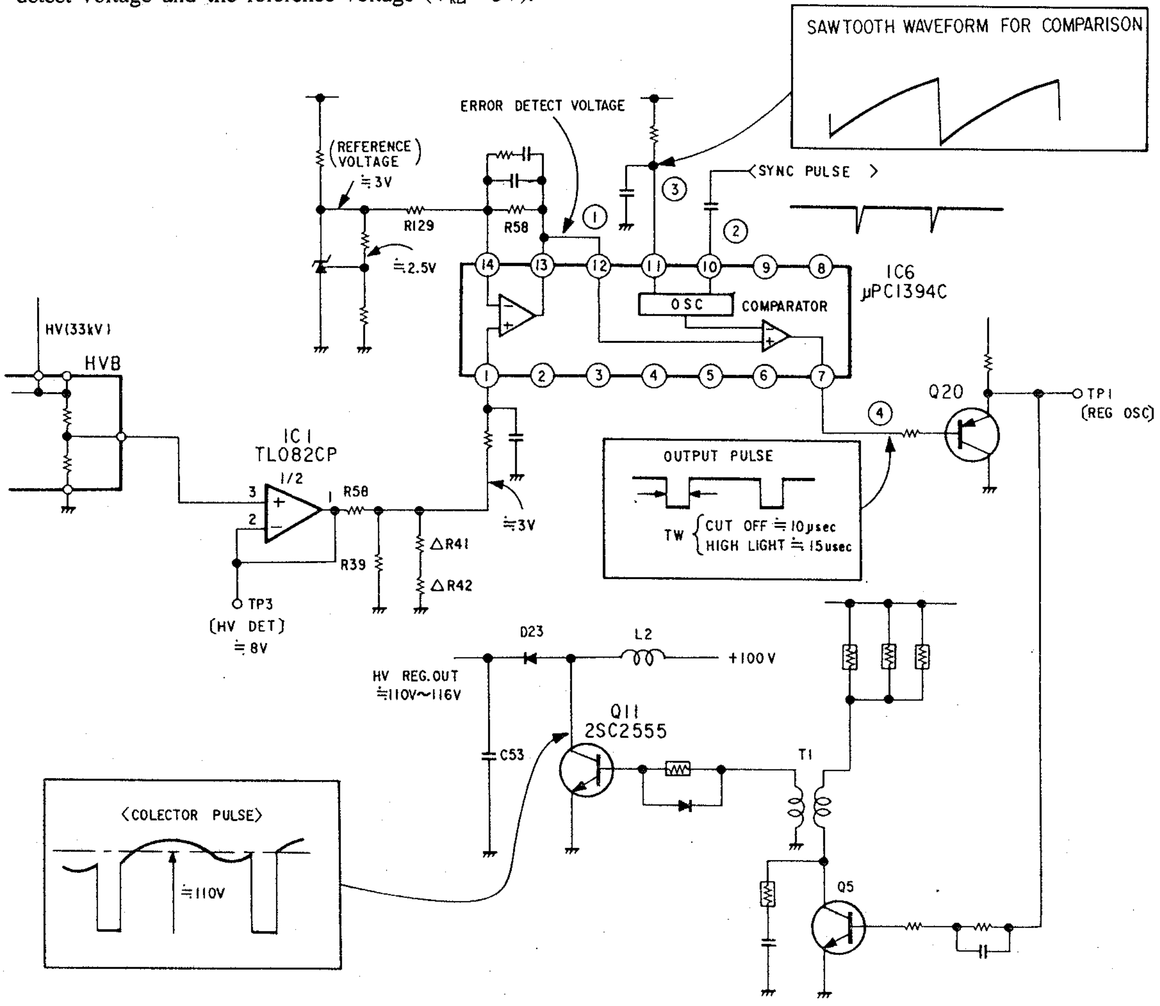

SAWTOOTH WAVEFORM FOR COMPARISON
ERROR DETECT VOLTAGE
(REFERENCE VOLTAGE) ≒3V
R129
R58
≒2.5V
<SYNC PULSE>
IC6
μPC1394C
OSC
COMPARATOR
HV(33kV)
HVB
IC1
TL082CP
1/2
R58
R39
ΔR41
ΔR42
TP3
(HV DET)
≒8V
≒3V
OUTPUT PULSE
TW {CUT OFF ≒ 10μsec
HIGH LIGHT ≒ 15usec
Q20
TP1
(REG OSC)
D23
L2
+100V
HV REG.OUT
≒110V~116V
C53
Q11
2SC2555
T1
Q5
<COLECTOR PULSE>
≒110V

Fig. 8-7. Simplified circuit diagram (HV regulator).

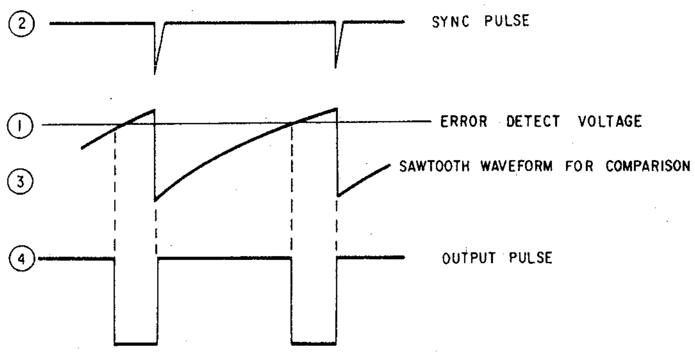

②
SYNC PULSE
①
ERROR DETECT VOLTAGE
③
SAWTOOTH WAVEFORM FOR COMPARISON
④
OUTPUT PULSE

Fig. 8-8

Here is a more detailed description on circuit operation. Drop in HV with heavier HV load causes divided voltage of HV (HV DET) to drop, hence output (pin ⑬ of IC6) of operational amplifier to drop. Decrease in this error voltage causes comparator's output to change as depicted in Fig. 8-9, and results in increase of T_{ON}.

HV drops → divider voltage (HV DET) drops → output of operational amplifier drops → T_{ON} of comparator's output increases

Increase in T_{ON} interval causes step-up portion by switching regulator (Δ V) to increase, and results in increase of V_{+B}. Increase of V_{+B} causes FBT's primary pulse height to increase. This increases FBT's secondary pulse height, and results in increase of HV.

Now you understand that the circuit is a feedback loop in total, do you?
That is, the reference voltage (V_{REF}) of non-inverting amplifier is used as reference of feedback operation to make HV detect voltage (HV DET) always equal to V_{REF} (3V).

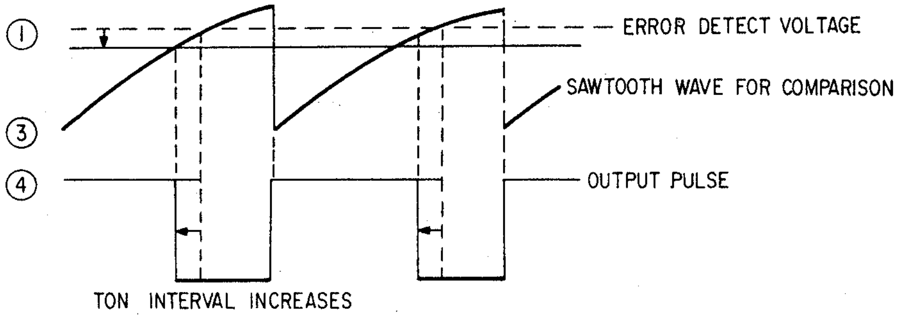

①
③
④
ERROR DETECT VOLTAGE
SAWTOOTH WAVE FOR COMPARISON
OUTPUT PULSE
TON INTERVAL INCREASES

Fig. 8-9

3-8-4. Protector

(1) HV protector

This is the protector to prevent HV from abnormal increase caused by some failure in the circuit. High voltage block (HVB) and R32, ⧓ R33, ⧓ R34 divide HV, and the resultant voltage enters to positive input (pin ⑤) of IC2 (1/2 of LM393P).
A reference voltage (about 4.8V) derived from a zener diode (RD5.1ESB2) is applied to negative input (pin ⑥) of IC2 (1/2 of LM393P). If HV increases and the voltage on positive input (pin ⑤) of the comparator exceeds the voltage on negative input (pin ⑥), the protector is activated. Sequence of operation is as follows:Output of 1/2 of IC2 (pin ⑦) becomes High (about 12V), and voltage on positive input (pin ③) of 2/2 of IC2 exceeds the voltage on negative input (pin ②) of the IC. This causes output (pin ①) of 2/2 of the IC to be High. This is applied to IC6 via D8 (1SS119) to make pin ⑤ of IC6 (μPC1394C) to High state (about 1V), and oscillation of HV regulator stops. Then Q7 (2SC2785) is turned ON to stop oscillation of HV converter. After deactivating HV, D28, Q16 and Q15 are turned ON to turn the power supply OFF. At the ex-factory, ⧓ R33 and ⧓ R34 are set to activate this protector with HV at 34kV ± 0.3kV.

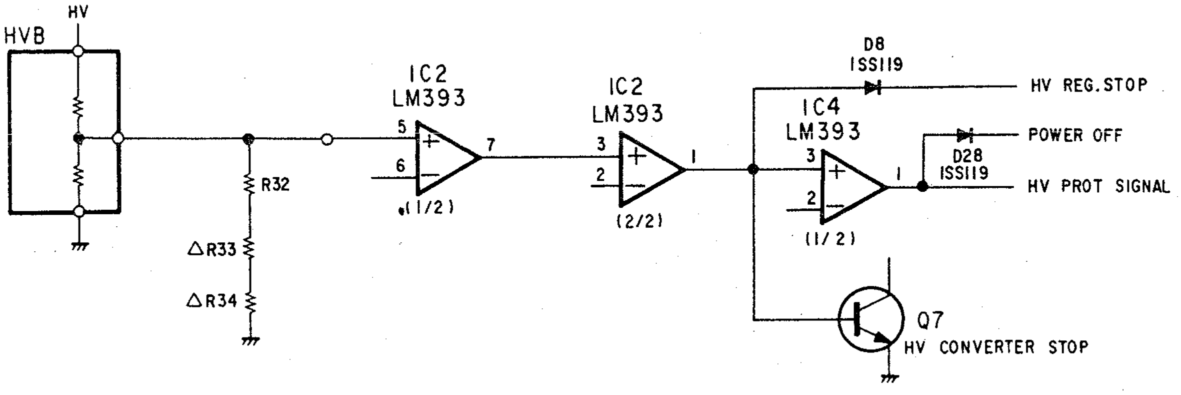

HV
HVB
R32
△R33
△R34
IC2
LM393
5
6
7
(1/2)
IC2
LM393
3
2
1
(2/2)
D8
1SS119
HV REG.STOP
IC4
LM393
3
2
1
(1/2)
D28
1SS119
POWER OFF
HV PROT SIGNAL
Q7
HV CONVERTER STOP

Fig. 8-10. HV protector

(2) Σ Ik protector ①

This is the protector to protect CRT from excessive beam current flow. R44, R45, R119, R46, R47 and R120 are used to convert FBT's secondary current into voltage. If the voltage exceeds a threshold level (about-18V), the protector is activated. Voltage detected here is divided by R121 and R1, then is applied to the base of Q1 (2SC2785). Q1 is always turned ON in normal state of operation. Increase in beam current causes the detected voltage to go down to negative direction, and Q1 is turned OFF at a threshold level to activate the protector.

Sequence of operation is as follows:
Q1 is turned OFF → collector of Q1 becomes High (about 12V) → voltage on positive input (pin ⑤) of 2/2 of IC3 (LM393P) becomes higher than that on negative input (pin ⑥) → output (pin ⑦) of the IC becomes High. After that, with a sequence similar to that in case of HV protector, D6 (1SS119) stops oscillation of HV regulator → Q8 (2SC2785) is turned ON → oscillation of HV converter stops → diode/transistors operate in the order of D29, Q16 and Q15 to turn the power OFF. Σ Ik protector is designed to be activated if FBT's secondary current (= sum of beam current flow in CRT) exceeds a threshold level about 4.3mA.

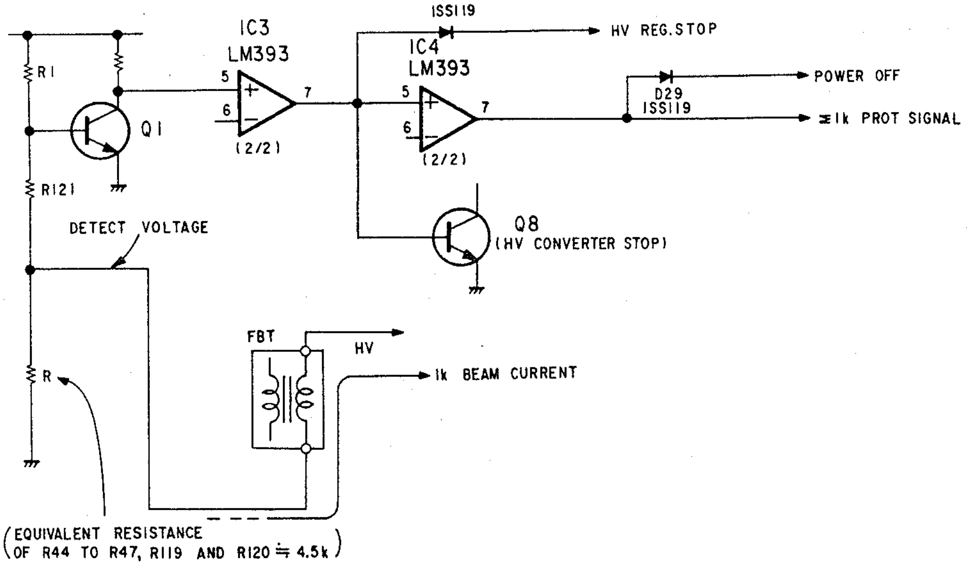

D6
1SS119
HV REG.STOP
IC3
LM393
IC4
LM393
R1
Q1
5
6
7
(2/2)
POWER OFF
D29
1SS119
ΣIk PROT SIGNAL
R121
DETECT VOLTAGE
Q8
(HV CONVERTER STOP)
FBT
HV
Ik BEAM CURRENT
R
(EQUIVALENT RESISTANCE OF R44 TO R47, R119 AND R120 ≒ 4.5k)

Fig. 8-11. Σ Ik Protector ①

(3) Σ Ik protector ②

Because of requirement from safety specifications, a spare Σ Ik protector is installed to protect CRT even if Σ Ik protector ① fails by some chance or other. Its operation is similar to that of Σ Ik protector①, that is, the protector is activated when the detect voltage drops and Q2 is turned OFF. Collector of Q2 is connected to positive input (pin ③) of 2/2 of IC2 (LM393P) via D3 (1SS119). This is a part of HV protector circuit, and the operation after D3 is same with that of HV protector. Current level where the protector is activated is same with that of Σ Ik protector ①

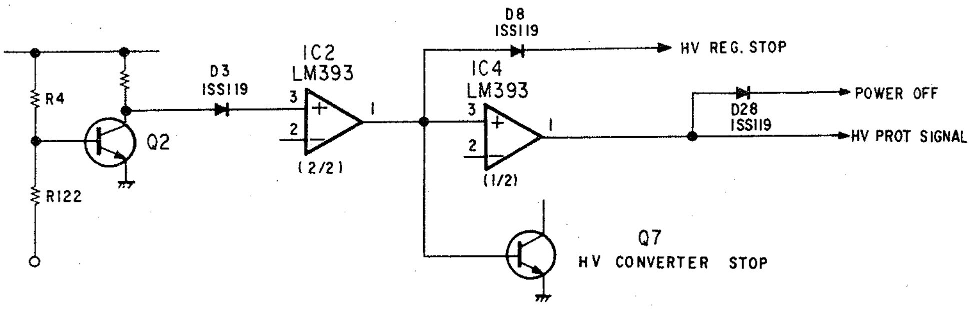

D8
1SS119
HV REG. STOP
IC2
LM393
D3
1SS119
IC4
LM393
R4
Q2
R122
3
2
1
(2/2)
(1/2)
POWER OFF
D28
1SS119
HV PROT SIGNAL
Q7
HV CONVERTER STOP

Fig. 8-12. Σ Ik Protector ②

(4) LOW +B protector

This protector is activated if IC5 (LM7812CT) which generates Low +B (+12volts) fails, and Low +B (+12 volts) increases. Low +B (+12 volts) is divided using a resistive divider, and is applied to non-inverting input (pin ⑤) of 2/2 of IC1 (TL082CP). On the other hand, a reference voltage(about 4.8V) derived from a zener diode D10 (RD5.1ESB2) is applied to inverting input (pin ⑥) of the IC.

If Low +B increases, voltage on non-inverting input (pin ⑤) becomes higher than that on inverting input (pin ⑥). This causes the IC's output (pin ⑦) to go to High, and the protector is activated via D11 (1SS119). D11 is connected to a portion of circuit of Σ Ik Protector ① . Operation after D11 is similar to that in Σ Ik Protector ① .

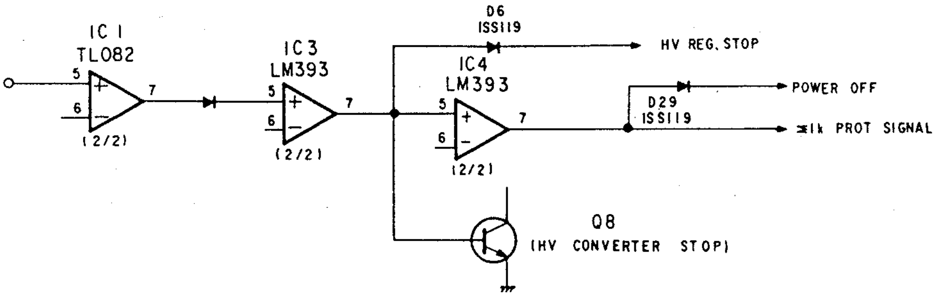

IC1
TL082
5
6
7
(2/2)
IC3
LM393
5
6
7
(2/2)
D6
1SS119
HV REG. STOP
IC4
LM393
5
6
7
(2/2)
POWER OFF
D29
1SS119
ΣIk PROT SIGNAL
Q8
(HV CONVERTER STOP)

Fig. 8-13. LOW +B Protector

(5) HV regulator protector

This protector protects components, such as switching transistor, etc., from being damaged. Protection is done by stopping oscillation of HV regulator at the occurrence of abnormal high voltage in HV regulator. Output voltage from HV regulator is divided by R48, R49, R50, R14 and R15, and the resultant voltage is applied to positive input (pin ③) of 1/2 of IC3 (LM-393P). Reference voltage (about 4.8V) enters to negative input (pin ②) of the IC. If regulator's output voltage increases, voltage on positive input (pin ③) becomes higher than that on negative input (pin ②). This causes IC's output (pin ①) to be High, and pin ⑤ of IC6 (μ PC1394C) to be High (about 1V) via D7 (1SS119), and oscillation of switching regulator to stop. The protector is designed to be activated at about 140V of regulator's output voltage.

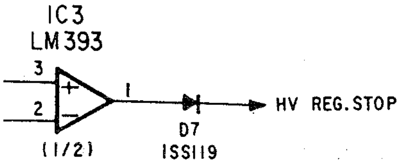

IC3
LM393
3
2
1
(1/2)
D7
1SS119
HV REG. STOP

Fig. 8-14. Reburator stop

(6) Power off circuit

To prevent secondary damage to occur in case of abnormal operating modes (e.g., deflection stop), circuit system of this projector is designed to turn immediately the power supply OFF in such cases. Of these protect signals, H. STOP (H deflection stop), V STOP (V deflection stop), FAN PROT (fan protector), HV protector, and Σ Ik protector are all concentrated to PA board to turn the power supply OFF.

H. STOP and V. STOP are OPEN collector outputs, and they are ORed by D24 and D25. In abnormal operating modes, Q16 and Q15 are turned ON to pull "POWER CONT" line down to Low state, and this causes the power supply to be turned OFF. "FAN PROT" signal is in polarity reversal to that of H. STOP or V. STOP, i.e. it is normally ON. Q17 is used to invert the polarity of FAN PROT signal, and apply it to Q15 in polarity same with that of V. STOP or H. STOP.

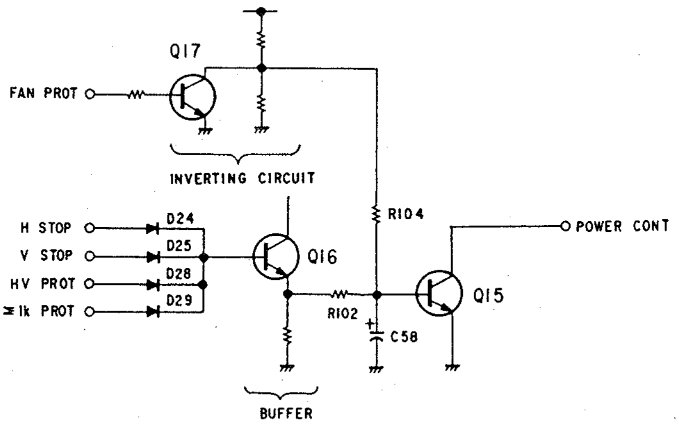

Q17
FAN PROT
INVERTING CIRCUIT
R104
H STOP
V STOP
HV PROT
ΣIk PROT
D24
D25
D28
D29
Q16
R102
C58
Q15
POWER CONT
BUFFER

Fig. 8-15. Power off circuit

3-8-5. HV Building-up Control Circuit

In power-on sequence, this circuit prevents HV regulator from operating until +100V power supply reaches to its complete building-up, to obtain a softer HV building-up curve.

Emitter of Q12 is connected to the power supply (pin ⑧) of IC6. Voltage on this point is regulated by a shunt regulator internal to IC6, and is about 6.4V. +100V is divided by R92 and R93, and is applied to the base of Q12. If the base voltage is lower than 5.7V (that is, emitter voltage (6.4V) minus V_{BE} (0.7V)), then Q12 is turned ON. This causes voltage on pin ① of IC6 to be nearly equal to emitter voltage (6.4V) of Q12. IC6 deems this as if HV detect voltage is higher than normal state, and prevents HV regulator's switching pulse from being output.

When +100V builds up about 90V, then Q12 is turned OFF. Normal operation starts, and HV regulator starts its operation.

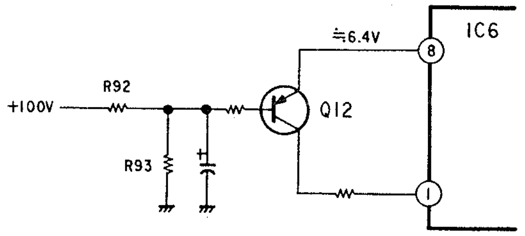

≒6.4V
IC6
8
R92
+100V
Q12
R93
1

Fig. 8-16

3-8-6. G2 Regulator

Essentially, G2 voltage (SCREEN) and G4 voltage (FOCUS) are generated by dividing medium voltage output (MV ≒ 14kV) from FBT using resistive dividers built in FOCUS PACK.

But sometimes, leak current from G4 terminal caused by discharge in CRT, etc., may flow into FOCUS PACK. The leak current is very small (less than 50μ A), but this causes change in high voltage to occur because impedance of FOCUS PACK is very high. Change in G2 voltage has much effect to picture quality than in G4 voltage. In this case, pedestal level in R, G, B channels shifts to a higher level, and results in change of white balance.

G2 regulator prevents change in G2 voltage regardless G4 leak current. Regulator's configuration is as shown in Fig. 8-17. Voltage on COMMON terminal is determined by a resistor R116 and the resistance in FOCUS PACK, and does not change even if G4 leak current flows.

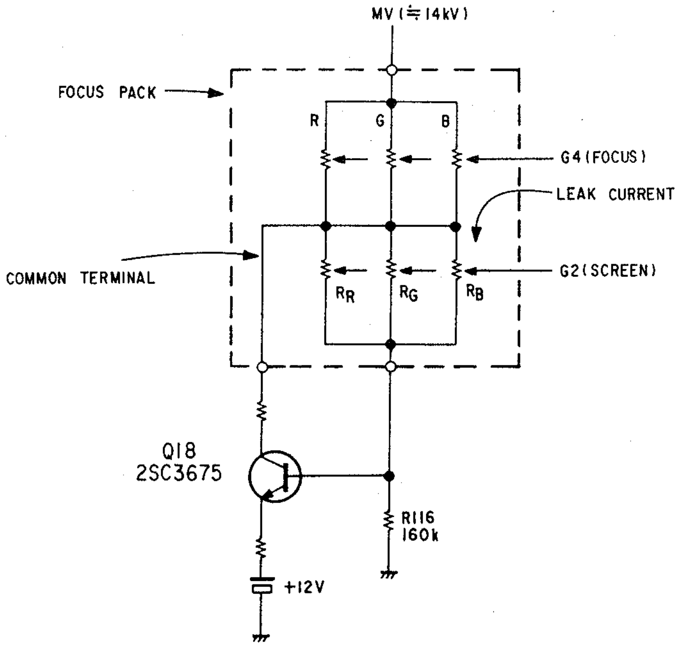

MV (≒14kV)
FOCUS PACK
R
G
B
G4 (FOCUS)
LEAK CURRENT
COMMON TERMINAL
G2 (SCREEN)
RR
RG
RB
Q18
2SC3675
R116
160k
+12V

Fig. 8-17. Simplified circuit diagram of G2 regulator

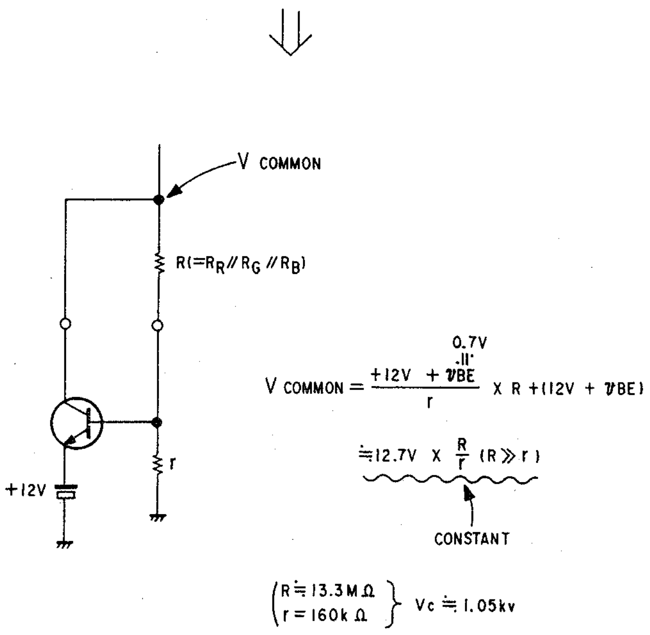

V COMMON
R(=RR//RG//RB)
r
+12V
0.7V
V COMMON = (+12V + VBE)/r X R + (12V + VBE)
≒12.7V X R/r (R≫r)
CONSTANT
R≒13.3MΩ
r=160kΩ
Vc ≒ 1.05kv

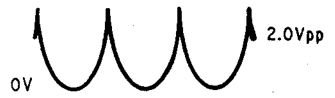
Fig. 8-18. Eguivalent circuit diagram of G2 regulator

3-9. CIRCUIT OPERATION OF K BOARD

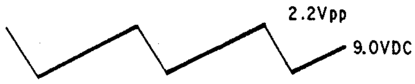
3-9-1. H Dynamic Focus

H. parabola waveform entered to pin ⑦ of connector "K-1" and H. sawtooth waveform entered to pin ⑧ of that connector are added together. After phase correction performed, the resultant waveform is inverted by 1/2 of IC201 (μPC814). IC202 (μPC814) and Q202 are used to amplify this inverted waveform. Output waveform passes a buffer (Q205 and Q206),then enter to dynamic focus transformer (DFT). DFT inverts the waveform, and amplitude of DFT output is 400Vp-p in case of input waveform of 30Vp-p to DFT.

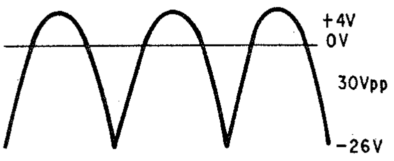
Waveforms in dynamic focus circuit with no signal input are as shown below:



⑦H. PARABORA WAVEFORM



⑧H SAWTOOTH WAVEFORM



OUTPUT FROM EMITTER OF Q205

Fig. 9-1.

3-9-2. V. Dynamic Focus

Dynamic focus waveform is added to focus voltage by capacitor-coupling in FOCUS PACK. Use of a capacitor with large capacitance is impossible because of restriction from withstanding voltage and size. In practice,a capacitor with small capacitance of only 100pF is used. Frequency of V. waveform is very low compared to that of H. waveform. Decrease in amplitude or phase rotation may occur with small capacitance of coupling capacitor. Circuit configuration shown below is adopted to enable transfer of V. focus waveform. Desired waveform is obtained by placing a time constant in the negative feedback loop same with that of C, R in FOCUS PACK.

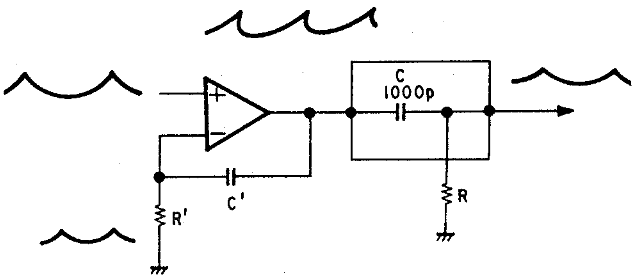
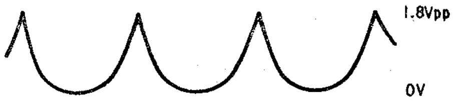


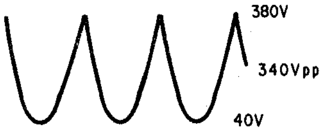
Fig. 9-2. Equivalent circuit

2/2 of IC201 (μPC814) is an operational amplifier for negative feedback, Q203 is an inverting amplifier, and Q204 is output buffer. Time constant of C210 (0.47μF) and R212 (10kohms) matches to the time constant of circuit in FOCUS PACK. DC feedback through this CR circuit is impossible because it is a differentiating circuit. So, after integration by R214 and C209, feedback is done from R213. To obtain V component amplitude of 100Vp-p in FOCUS PACK, output amplitude of Q204 changes in 150Vp-p to 400Vp-p range in accordance with V frequency. The output is applied to DFT's secondary winding, and V component is superposed on H component. Resultant waveform is entered to FOCUS PACK.

Waveforms in V dynamic focus circuit and DF output on connector "K-2" are as shown below:



⑥ V.PARABORA WAVEFORM



OUTPUT FROM SOURCE OF Q204

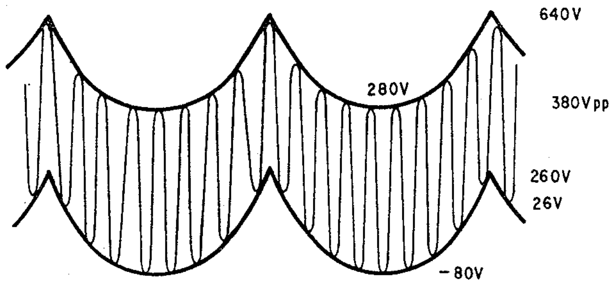


Fig. 9-3. DF output on connector K-2

3-10. CIRCUIT OPERATION OF Y BOARD

3-10-1. Power Supply Block

PS1 and PS2 are used as fuses to cut the power supply OFF at occurrence of over-current in Y board. D1 reduces input voltage +5.7V to +5.0V, and D2 reduces input voltage -5.7V to − 5.0V.

Sub +5.0V is supplied at main power-on of the projector, and ± 5.7V are supplied when powered the projector ON from the commander.

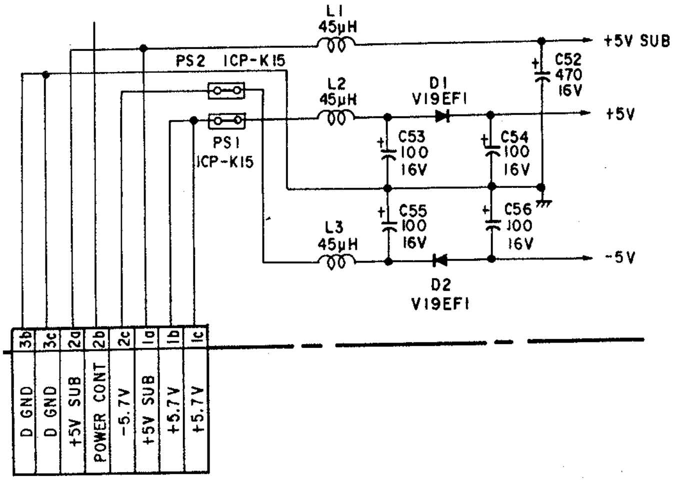

L1
45μH
+5V SUB
PS2 ICP-K15
C52
470
16V
L2
45μH
D1
V19EF1
+5V
PS1
ICP-K15
C53
100
16V
C54
100
16V
C55
100
16V
C56
100
16V
L3
45μH
-5V
D2
V19EF1
3b
3c
2a
2b
2c
1a
1b
1c
D GND
D GND
+5V SUB
POWER CONT
-5.7V
+5V SUB
+5.7V
+5.7V

Fig. 10-1. Circuit diagram of power-supply block

3-10-2. CPU Block

1. CPU (IC1 HD64180R1P8)

HD64180R1P8 is selected as CPU (IC1). This is a CPU of Z80 type, and SIO/TIMER/DMA functions are incorporated in 1-chip. It also includes clock oscillation circuit, and in addition to NMI, it is equipped with 3 interrupt levels.

① Clock (X1)

Based upon baud rate of RS422 serial communication, clock frequency of 12.288MHz is selected. A quartz crystal (X1) is used. (Internal operating frequency is 6.144MHz.)

② Assignment of interrupt lines/ports

* NMI ········not defined
* INT0········power off/power down (protector)
* INT1········SW2 (data reset)/VD (refresh)
* INT2········SIRCS receive
* SIO ch0 ····RS422 (internal interrupt)
* TIMER A··100msec timer 1 (for software timer)
* TIMER B··100msec timer 2 (for SIRCS continuance detection)

2. Reset circuit (IC5, IC33, D9)

Diode-AND is formed by a reset circuit consisting of R62, C2, IC5 and IC33.

Simultaneous initialization to CPU, IC9, IC10, IC11 and IC13 is done by the reset circuit above.

Should momentary power voltage drop occur from momentary power-off, circuit around IC33 ensures adequate reset operation be performed.

commentary) IC33

If power-supply voltage on +5V SUB line drops below 4.3V (± 1.07V) because of momentary power off for example, pin ① of IC33 becomes Low. When +5V SUB line returns above 4.5V (± 1.07V), pin ① of IC33 becomes High. This results in generation of a reset pulse, and the pulse is used to reset IC1, etc.

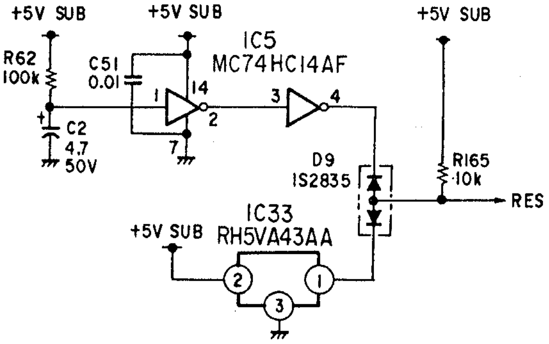


Fig. 10-2. Reset circuit

3. Memories

In addition to ROMs/RAMs required in normal execution of softwares, this circuit is equipped with memories to store data such as adjustment data to cope with power-off, etc.

* PROGRAM ROM (IC2 MBM27C512)
* S-RAM (IC3 CXK5864BM)
* EEPROM (IC4 X28C64PI)

4. Address encode (IC10, IC28)

IC10 (MB670840PF) performs address encoding except for I/O internal to CPU.

Control to I/O areas:

Pin No.	Function	
I/01 (pin 77)	WAIT terminal of CPU (IC1)	
I/02 (pin 80)	gate array for SYNC control (IC11)	
I/03 (pin 81) IC28 (MC74HC00)	IN-port (IC32) gate array for fH/fV detect (IC12) (I/O 5 line)	
I/04 (pin 82)	gate array for cha. gen./Int. SG Gen. (IC13)	
EXT 1 (pin 83)	L board	external port to boards other then Y board
EXT 2 (pin 84)	DB board, D ATT	
EXTE (pin 85)	address buffer (IC8) data buffer (IC7)	

Table 10-1

EXT1 and EXT2 are used for address encoding to external I/O. "EXTE" terminal, which becomes Low when EXT1 or EXT2 is Low, is used to enable external bus buffers. This is done to protect signal system or deflection system from noise by making external buses high impedance state except when access to external I/Os is done. Also, the software is so designed that access to external I/O is done during V-blanking interval only to avoid adverse effects to picture quality.

5. External bus buffers (IC7, IC8: MC74HC541F)

IC7 and IC8 are buffers to send data to electronic attenuators on DB board and to error code display on L board, if exists. Parallel transmission is adopted because instantaneous transfer of more than 200 data is necessary.

6. RS422 port (IC24, driver/receiver)

RS232C is generally used in computer communication. In this projector, however, RS422 is adopted which is suitable for long-distance, high-speed data transmission. In projector systems, the controller is often installed in a place distant from projector's main unit, e.g., in an adjacent room. If main unit of projector is installed pendant from ceiling, distance between main unit and the controller may extend more than 30 meters. MC34051 (IC24) is used which incorporates a transmitter and a receiver in 1-chip.

3-10-3. I/O Port Block

1. Parallel Interface and Interrupt control (IC10 : MB670840PF)

IC10 is equipped with 6 sets of 8 bit parallel port shown below for detection of operating status of the set and control to various functions. A "Programable. Port" is the port which permits IN/OUT presteting on each bit by software, and if it is preset to IN, also permits presetting connection to ports (INT0 to INT2) at the time of interruption (High active or Low active).

* IN-port 1 INPUT STATUS/SYSTEM STATUS					
pin-95 bit7 "NOINP"	no-input detect [0: no-det, 1: detect]				
pin-96 bit6 "I/V"	RGB/Video [0: RGB, 1: Video]				
pin-97 bit5 "LP"	[0: norm]				
pin-98 bit4 "3HD"	3-sync detect [0: norm, 1: detect]				
		B/W	PAL	NTSC	SECAM
pin-99 bit3 "CD2"	code 2	0	0	1	1
pin-100 bit2 "CD1"	code 1	0	1	0	1
pin-1 bit1 "V/Y"	Video/YC (S-terminal) [0: YC, 1: Video]				
pin-2 bit0 "R/V"	Input Video/RGB [0: Video, 1: RGB]				
* OUT-port 1 SYSTEM CONTROL					
pin-5 bit7 "C/B"	[don't care]				
pin-6 bit6 "R/Y"	[don't care]				
	Video	Slot-A	Slot-B	CCQ	
pin-9 bit3 "CCQ"	1	0	0	0	
pin-10 bit2 "SLOT"	1	0	0	1	
pin-11 bit1 "S2"	1	1	0	1	
pin-12 bit0 "S1"	1	0	1	1	
* OUT-port 2 SYSTEM CONTROL					
pin-86 bit7 "BOF"	Blue Beam Cut-off [0: norm, 1: cut off]				
pin-87 bit6 "GOF"	Green Beam Cut-off [0: norm, 1: cut off]				
pin-88 bit5 "ROF"	Red Beam Cut-off [0: norm, 1: cut off]				
pin-89 bit4 "SEC"	Secam on/off [0: on, 1: off]				
pin-94 bit0 "CB"	Clear Blue on/off [0: on, 1: off]				
* OUT-port 3 SYSTEM CONTROL					
pin-13 bit7 "DLY"	Clamp Pulse Delay [0: norm, 1: delay]				
pin-14 bit6 "PHS"	Clamp Pulse Trigger Source Select [0: ext-sync, 1: int-sync]				
* Programmable-port 1 DIP SW, etc.					
pin-32 bit7 IN "V-I"	Def. V-invert [0: norm, 1: inv]				
pin-33 bit6 IN "H-I"	Def. H-invert [0: norm, 1: inv]				
pin-34 bit5 OUT "LED"	LED (D4) [0: off, 1: on]				
pin-35 bit4 IN (int1) "5"	SW2 [0: on, 1: off]				
pin-36 bit3 IN "4"	SW1-4 [0: on, 1: off]				
pin-37 bit2 IN (int1) "3"	VD (for refresh) [pos-pulse]				
pin-38 bit1, 0 IN "2, 1"	SW1-2, 1 [0: on, 1: off]				
* Programmable-port 2 PROTECTOR/POWER					
pin-22 bit7 IN (int0) "+5V"	+5V power [0: power off, 1: norm]				
pin-23 bit6 IN (int0) "POW"	Power Cont. [0: on, 1: off]				
pin-24 bit5 IN (int2) "CONT"	SIRCS receive [0: active, 1: norm]				
pin-25 bit4 IN (int0) "HV"	High-Vol Protect [0: norm, 1: act]				
pin-26 bit3 IN (int0) "VP"	V-Stop Protect [0: norm, 1: act]				
pin-27 bit2 IN (int0) "IKP"	Ik-over Protect [0: norm, 1: act]				
pin-30 bit1 IN (int0) "HP"	H-Stop Protect [0: norm, 1: act]				
pin-31 bit1 IN (int0) "FP"	Fan Stop Protect [0: act, 1: norm]				

Table 10-2

2. DIP SW (SW1, SW2)

SW1 is used to set up special operating mode required in factory adjustment. All bits (SW1-1 to -4) are set to "0" in normal operation.

Pressing SW2 causes all adjustment data to return to factory default..

3-10-4. SIRCS Decode IC Interface

1. Sircs code read process

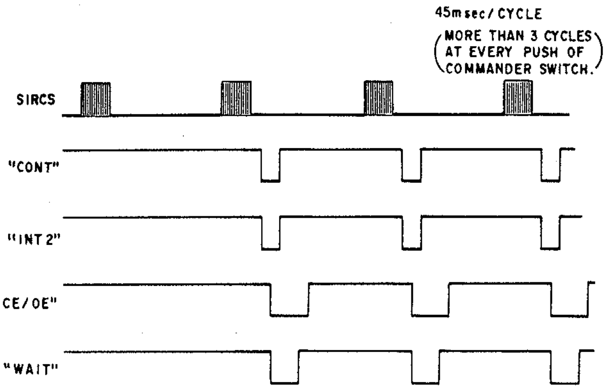


Fig. 10-3

(1) SIRCS IC (IC9) pulls down "cont" terminal to Low state when it receives continuous 2 cycles of same SIRCS code.
(2) The "cont" signal sends interrupt request (int2) to CPU via IC10.
(3) After acknowledged the interrupt request, CPU reads the port of IC9, and CE/OE terminal of SIRCS IC (IC9) is pulled down to Low state.
(4) At the same time, a monostable multivibrator (IC6) is triggered, and CPU becomes WAIT state.
(5) With its CE/OE terminal in Low state, IC9 outputs decoded data onto data bus, and "cont" terminal returns to High state. At the same time, the interrupt request to CPU is released.
(6) After a few milli-seconds, the monostable multivibrator is released. This releases WAIT state of CPU, and CPU acquires data.
(7) After reading data, CPU returns CE/OE terminal to High state.

With the sequence described above, CPU acquires SIRCS CODEs.
WAIT state is required to give a time of software execution on IC9 because IC9 is an 1-chip microcomputer.

* SIRCS CODE: category code for PJ "00101010"

2. Power ON/OFF & protector operation

① Normal POWER ON/OFF (IC9, Q3)

SIRCS IC (IC9) controls normal POWER ON/OFF initiated from the commander independent from CPU. This is done to perform POWER ON/OFF regardless malfunction of CPU or software bugs.

POWER ON/(OFF) sequence is as follows:

POWER ON

(1) At receiving POWER ON CODE, SIRCS IC pulls down "power" terminal (pin ㉘) to Low state.
(2) Q3 is turned ON, and current flows via R67 and R124 to turn the power supply unit ON.

POWER OFF

(1) At receiving POWER OFF CODE, SIRCS IC pulls up "power" terminal (pin ㉘) to High state.
(2) Q3 is turned OFF, and current flow through R67 and R124 stops, and the power supply unit is turned OFF.

② PROTECTOR operation (IC9, Q4, Q5)

Forced pull-down to GND of "POWER CONT" line, which controls the power supply unit, causes automatic power shut-down to occur at activation of PROTECTOR circuit. In this case, simultaneous reset to SIRCS IC (IC9) is required to prevent oscillation of the circuit because Q3 is still ON regardless of GND level on "POWER CONT" line, and this causes the power supply unit to be turned ON again.

To prevent the oscillation to occur, reset at PROTECTOR operation is done in following sequence:

(1) At the activation of PROTECTOR, "POWER CONT" line is externally pulled down to GND.
(2) Collector current of Q3 increases very much, and Q4 is turned ON.
(3) Base current of Q5 flows through a low-pass filter (R69, C14, C65), and Q5 is turned ON.
(4) "RESET" terminal of IC9 becomes Low state. This resets IC9, and Q3 is turned OFF.

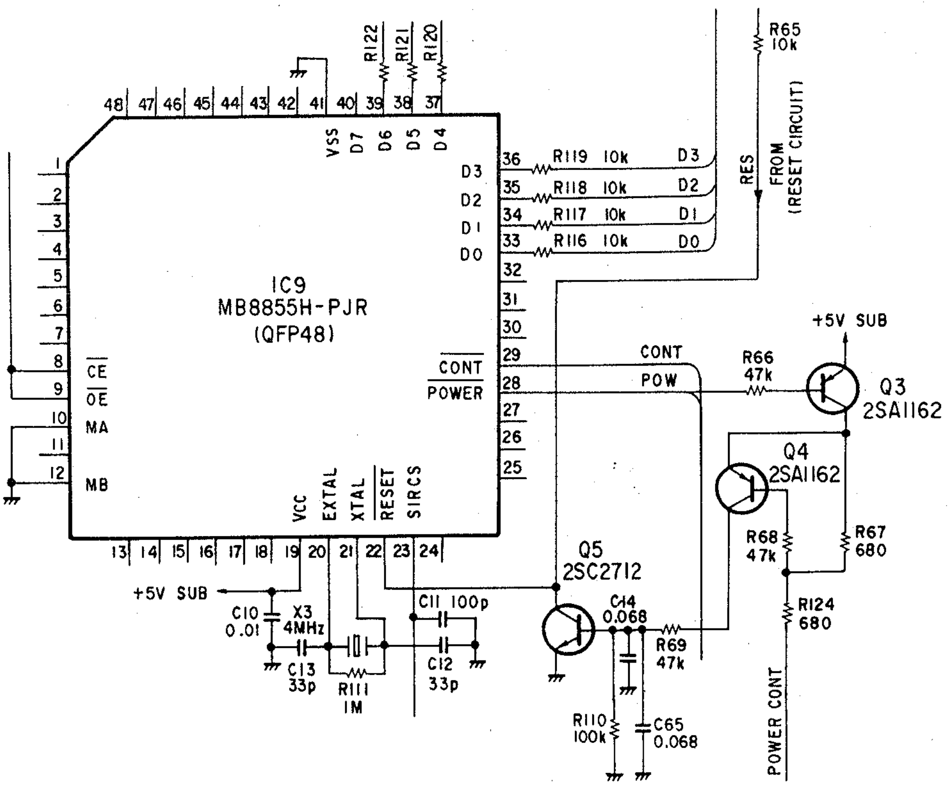

IC9
MB8855H-PJR
(QFP48)
CE
OE
MA
MB
VSS
D7
D6
D5
D4
D3
D2
D1
D0
CONT
POWER
VCC
EXTAL
XTAL
RESET
SIRCS
R122
R121
R120
R119 10k
R118 10k
R117 10k
R116 10k
R65
10k
RES
FROM
(RESET CIRCUIT)
+5V SUB
CONT
POW
R66
47k
Q3
2SA1162
Q4
2SA1162
R68
47k
R67
680
R124
680
Q5
2SC2712
C14
0.068
R69
47k
R110
100k
C65
0.068
POWER CONT
+5V SUB
C10
0.01
X3
4MHz
C13
33p
R111
1M
C11 100p
C12
33p

Fig. 10-4 Circuit of SIRCS decode block

3-10-5. SYNC Block

1. Input sync presence/polarity detection (IC11 MB654842UPF)

① INPUT SYNC PRESENCE DETECTION

3 types of SYNC signal enters to IC11. Detection in presence of input signal is done per following conditions:

∗ H/C sync (TTL level)

With Video input, composite-sync separated from input video on BB board enters to IC11. With RGB input, signal connected to H/C-sync terminal (pin ㉛) enters to IC11. Presence of input signal is determined simply by presence of sync pulse.

∗ V sync (TTL level)

With Video input, V-sync separated from input video on BB board enters to IC11. With RGB input, signal connected to V-sync terminal (pin ㉜) enters to IC11. Presence of input signal is determined simply by presence of sync pulse. Detection circuit operates only with presence of HD input.

∗ Sync on Green (TTL level)

With Video input, composite-sync separated from input video on BB board enters to IC11. With RGB input, composite-sync separated from Green signal (pin ㉚) on BB board enters to IC11. IC11 determines that input is present if non-changing intervals of more than 180μS appear at a period less than 30msec, and that input is not present if such interval does not appear.

NOTE:

At the 1st step, signal connected to H/C-sync input terminal is deemed as composite-sync. IC29 detects the presence of pulse on V-sync out terminal of IC11. If the pulse is present, then input signal is determined as composite-sync. If not, it is determined as H-sync. Also in SonG mode, detect condition above may not be satisfied if V-sync has no serration with H (H/2) period. In this case, final determination is done by presence of V-sync out when SonG mode is selected.

② INPUT SYNC POLARITY DETECTION

∗ H/C sync, V sync

Principle of polarity detection is: an UP/DOWN counter counts period of one-cycle of input sync to determine polarity of sync based on the counted value.

∗ Sync on Green

Negative polarity only, in this case.

2. Sync select (IC11, IC34)

① SYNC SOURCE SELECTION

Based on the presence of input, source selection of H-sync/V-sync to be sent to deflection system is done. Priority is given to external SYNC. CPU determines the state as shown in the table below, and controls IC11 via CPU bus.

sync detection			sync source selection	Clamp pulse trigger *
VD	HD/C	SonG	DATA PJ	
—	—	—	no-input	—
—	—	DET	SonG	SonG
—	HD	—	no-input	HD
—	C	—	C-sync	C-sync
—	HD	det	SonG	SonG
—	C	det	C-sync	SonG
det	—	—	no-input	—
det	—	det	SonG	SonG
det	HD	—	HD/VD	HD
det	C	—	C/VD	C-sync
det	HD	det	HD/VD	SonG
det	C	det	C/VD	SonG

* : Selection of clamp pulse in "page 3" display during Auto mode.

Table 10-3

② SYNC OUT SELECT (IC34: MC74HC157)

Selection of H-SYNC and V-SYNC to be sent from Y board to deflection system (DA board) is done as shown below using a signal selector IC34.

* With Video input
H-SYNC/V-SYNC separated from composite video on BB board are sent to deflection system (regardless of IC11's output).

* With RGB input
H-SYNC/V-SYNC controlled in IC11 (as described in section ①) are sent to deflection system.

* Relationship between "sync source selection" in the table 10-3 and H-SYNC/V-SYNC out from IC11 is as shown Table 10-4.

sync source selection	H-SYNC out (pin (59))	V-SYNC out (pin (60))
no-input	————	————
SonG	H-SYNC separated from SonG	V-SYNC separated from SonG
C-sync	H-SYNC separated from composite SYNC	V-SYNC separated from composite SYNC
HD/VD	H-SYNC derived from HD and in negative polarity	V-SYNC derived from VD and in negative polarity
C/VD	H-SYNC separated from composite SYNC	V-SYNC derived from VD and in negative polarity

Table 10-4

3. Unified sync polarity (IC11)

Polarity of H/C-sync or V-sync is different depending upon computer systems connected. In this projector, IC11 determines sync polarity, and sends the information to CPU. IC11 also processes sync signal to make sync polarity uniform, i.e., negative polarity.

4. H/V separator (IC11)

If the selected SYNC SOURCE is C-sync or SonG, it is necessary to separate H-sync and V-sync from it to send them to deflection system.

This is done by "Digital H/V-separator" in IC11. The separator requires no adjustment in 15 kHz to 92 kHz range. If equalizing pulses exist, they are separated and are output.

Sync outputs from IC11 are H-sync (pin (59)) and V-sync (pin (60)). They are signals of TTL level.

NOTE:

Weak point of "Digital H/V-separator" is unstable output for about 0.5 sec. at interrupt of input signal or at change in frequency. Without V-sync for about 0.5 sec., free-running of AFC circuit occurs. Time required to lock-up to the next sync input is about 5 seconds. To cope with this problem, the software is so designed that sync from internal SG is used until completion of signal switching.

5. Clamp pulse generation (IC11, IC30, IC31)

Generation of back-porch clamp pulse (from pin (53)) is done depending on types of "Clamp Pulse Trigger" described in section 5-2, and at the timing shown below:

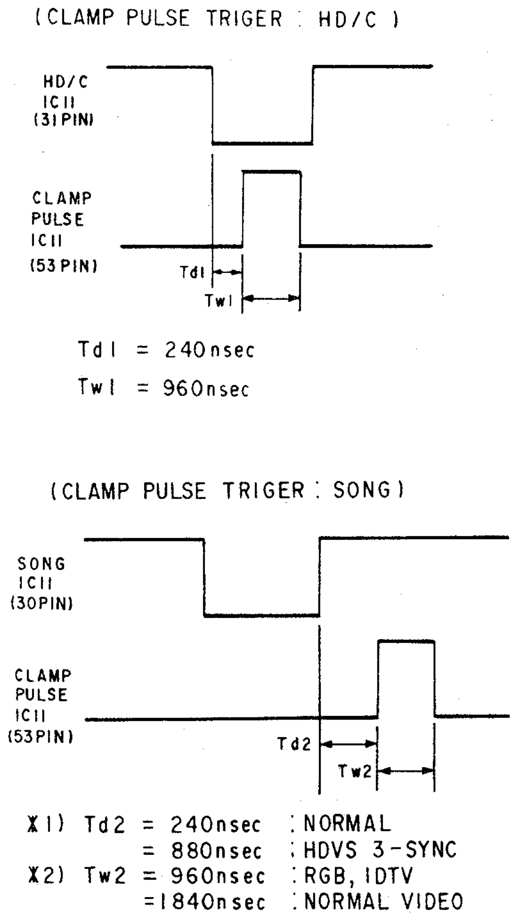

(CLAMP PULSE TRIGER : HD/C)
HD/C IC11 (31PIN)
CLAMP PULSE IC11 (53PIN)
Td1
Tw1
Td1 = 240nsec
Tw1 = 960nsec
(CLAMP PULSE TRIGER : SONG)
SONG IC11 (30PIN)
CLAMP PULSE IC11 (53PIN)
Td2
Tw2
※1) Td2 = 240nsec : NORMAL
= 880nsec : HDVS 3-SYNC
※2) Tw2 = 960nsec : RGB, IDTV
=1840nsec : NORMAL VIDEO

Fig. 10-5

∗ 1) Control is done from pin ㊱ of IC11.
∗ 2) Control is done from pins ㊵, ㊳ and ㊲ of IC11.

NOTE 1:

Values shown above are center of design, and in practice, they distribute in +40 nsec. to − 40 nsec. range.

NOTE 2:

If V-sync has no serration, and input signal is C-sync or H/C-sync, possibility of missed clamping exists because no correct detection in presence of SonG is possible.

In such a case, disconnection of external sync signal is requested. If disconnection of sync only is impossible because a D-sub pin ⑨ connector is used, a special procedure (In "Page" mode, change "clamp pulse setup" on sync signal selection as the trigger for clamp pulse generation. This will be possible on software version '012' and after.) is necessary.

< Clamp pulse Trigger: H.P = H pulse >

When an input signal causes missed clamping to occur regardless of clamp pulse selection (i.e., Auto, SonG, or H/C) in "Page 3" mode:
(ex. SonG input only, and B.P. is less than 960ns).

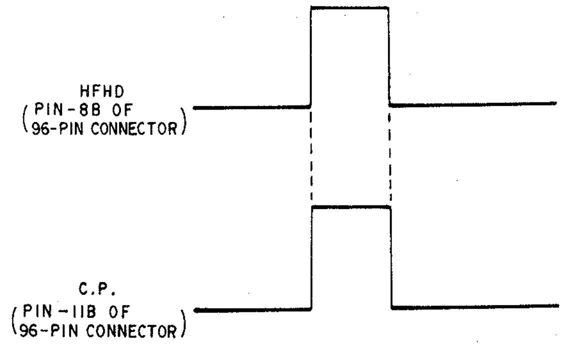

HFHD
(PIN-8B OF 96-PIN CONNECTOR)
C.P.
(PIN-11B OF 96-PIN CONNECTOR)

Fig. 10-6

NOTE:
Clamp pulse output from Y board differs depending upon clamp pulse selection in "Page 3" mode.

(1) Clamp: Auto / H/C / SonG,
Output from pin (53) of IC11 is selected as the output on pin 11b of 96 pin connector.

(2) Clamp: H. P
Clamp: H.P H. pulse (HFHD: pin 8b of 96 pin connector) from deflection system is output from pin 11b of 96 pin connector.

Switching between (1) and (2) is done by control from CPU to a signal selector consisting of IC30 (74HC126) and IC31 (74HC14).

6. Sync width regulation of H-Sync out (IC6: 74HC123)

Except during video input, the width of the H-Sync output to the deflection system is fixed at approximately 2 μsec.

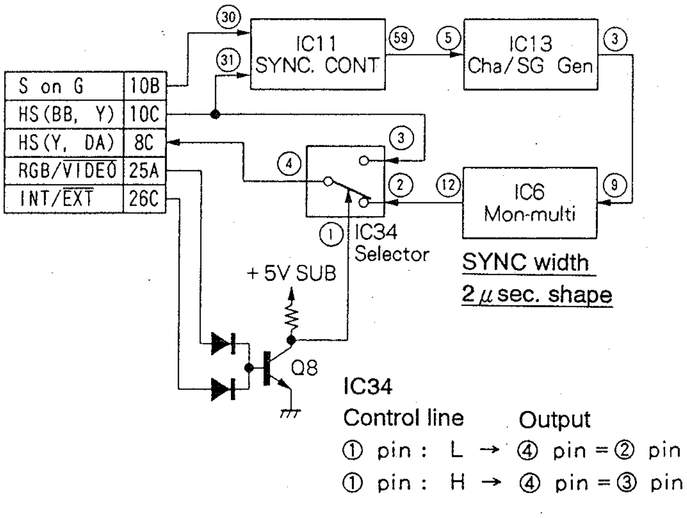

S on G 10B
HS(BB, Y) 10C
HS(Y, DA) 8C
RGB/VIDEO 25A
INT/EXT 26C
㉚
㉛
IC11 SYNC. CONT
(59)
⑤
IC13 Cha/SG Gen
③
③
④
②
⑫
①
IC6 Mon-multi
⑨
IC34 Selector
+5V SUB
Q8
SYNC width 2μsec. shape
IC34
Control line Output
① pin : L → ④ pin = ② pin
① pin : H → ④ pin = ③ pin

Fig. 10-7 Flow of H. SYNC

7. **V-Sync detection (IC29: 74HC123)**
To discriminate if the signal input to the H/C-Sync input terminal is composite or not, IC29 detects if the V-Sync out (pin (60)) pulse of IC11 is present or absent, and transmits it to the CPU.

3-10-6. f_H/f_V Detector Block

A gate array (IC12, MB671469PF) is developed for f_H/f_V detection. IC12 consists of a f_H detector and a H-sync counter. The f_H detector performs measurement of successive 16H time interval using 16MHz clock generated by a quartz crystal. The H-sync counter counts H-sync in 2V time interval.

This circuit is so designed that it does not respond to sudden change in f_H caused by noises, etc. or to jitters less than 0.4%.

Also, HF.HD/VD returned from deflection system are applied to H-IN (pin (52))/V-IN (pin (53)) of the IC to improve its accuracy of operation by counting pulses averaged by AFC.

The software is so designed that, based upon f_H data acquired from the IC, it ignores errors less than 1/256 in fH or less than 3 scanning lines in f_V. This is quite agreeable level.

Based on values of f_H/f_V thus detected, following operation is done:

* Compensation to divergence of registration depending upon f_H.
* Compensation to color temperature depending upon f_H.
* Discrimination of input signal.
* Determination of number of scanning lines required in constructing a character.
* Determination of hatch spacing in vertical direction.

3-10-7. Character & Built-in Test Signal Generator Block

1. Character & Built-in Test Signal Generation (IC13, 14, 15, 16, 17)

① Gate array (IC13)

IC13 (MB605195PF) is a 120 pin, C-MOS gate array, and its input/output is of TTL level.

With an input, IC generates characters and built-in test signals in synchronous with frequency of the input signal using clock signal synchronous with "HF.HD" (pin ㊱: CKIN) and "VD" (pin ㉟: VDIN).

Without input signal, IC generates H-sync (f_H = 34.3 kHz), V-sync (f_V = 65.0Hz), characters and test signals in synchronous with internal frequency generated by a ceramic resonator (X4).

		pin-number of IC13
Characters	Red	pin ㊹ (RCHA)
	Green	pin ㊸ (GCHA)
	Blue	pin ㊷ (BCHA)
	shadow area	pin ㊵ (BORDER)
Built-in Test Signals	cross hairs	pin ㊼ (INSG)
	hatch (5 * 5)	pin ㊼ (INSG)
	hatch (9 * 9)	pin ㊼ (INSG)
	hatch in reversal video (9 * 9)	pin ㊼ (INSG)
	dots	pin ㊼ (INSG)
	H pattern	pin ㊼ (INSG)
	white flat field signal	pin ㊼ (INSG)
	window	pin ㊼ (INSG)
	PLUGE (5IRE portion)	pin ㊾ (PH)
	PLUGE (− 5IRE portion)	pin ㊿ (PL)
	hatch + cursor	pin ㊽ (CBLT)
Miscellaneous	H-sync (IN)	pin ⑤ (HSIN)
	V-sync (IN)	pin ④ (VSIN)
	H-sync (OUT)	pin ③ (HS)
	V-sync (OUT)	pin ② (VS)
	presence of input signal detect	pin ⑥ (I/E)
	test mode detect	pin ㊺ (N/T)

(H: present, L: not present)
(H: normal mode, L: test mode)

Table 10-5

To suppress crosstalk between external signal and internal oscillation (X4), D5 is used to enable internal oscillation only when no input signal is present.

② RAM (IC14)

This is one of external memories, and is used as a Video RAM for characters. CPU writes ASCII code, location/color of display on this Video RAM via IC13.

Capacity is 2k bytes because 2 pages (the 1st page for ASCII codes, and the 2nd page for color data) of character configuration of 28 characters × 12 lines (effective area of screen is 28 characters × 12 lines, however, larger configuration said above is necessary because of dummy read during blanking interval, and of easy mapping) are required.

Real-time read operation in synchronous with input signal is performed. In 1H time, data bus is connected to CPU for a half of time required to display one character. Let the remaining half of time required to display a character further be divided in two, and access operation to 36 characters be required in reading ASCII codes and color data during 1H time including H blanking intervals. Then, minimum access time Tamin. is calculated by following equation:

$$\text{Tamin.} = \left(\frac{1}{92}\,[\text{kHz}]\right) / (36 \times 4) = 75\ [\text{nsec}]$$

In this projector, SONY's high-speed, C-MOS S-RAM (CXK5814P-45L) with access time of 45 nsec. is used.

③ Font ROMs (IC15, 16, 17)

111 characters in total are used, i.e., numbers, alphabets (upper-case and lower-case), general symbols, and symbols used in European TV receivers.

Dot configuration is 12 × 16, and ROM capacity required is about 8k bytes because separate data are necessary for characters and border areas.

If a ROM of 8-bit type is used, time-division processing is necessary for 3 times because one character contains information of (12 + 12) bits (for character and for border) in horizontal direction. Minimum access time Tamin. is calculated by following equation, as in the case of section ② RAM. The value is too fast for general-purpose C-MOS ICs.

$$\text{Tamin.} = \left(\frac{1}{92}\,[\text{kHz}]\right) / (36 \times 3) = 100\ [\text{nsec}]$$

To cope with this, 3 ROMs are used to permit simultaneous access to data of 24-bits. This results in 300 [nsec] of Tamin., and permits use of low price C-MOS ROMs.

In practice, SONY's 64 kbit mask ROMs (FP28) are used. (IC15: CXK3864-040M, IC16: CXK3864-041M, IC17: CXK3864-042M)

3. PLL circuit (IC20, 21, 22, 23, 25, Q6, Q9)

① Basic configuration

Generation of characters and of built-in test signals is synchronized with input signal (HF.HD and VD, strictly speaking) using a PLL circuit. Output from phase comparator (IC20) passes a low-pass filter consisting of R170, R178, C85 and C86, then enters to a VCO (IC21). Output from the VCO enters to "CKIN" of IC13, then passes a 1/417 pre-scaler in IC13 before returning to the phase comparator.

With only one VCO, it is impossible to cope with the lock-in frequency range required. So, two VCOs (IC21 consists of two VCOs) are used, that is, one is used for high-band and the other for low-band. Switching between these two VCOs is done by a voltage comparator (IC22) and a flip-flop (IC23). For details, refer to section ② Lock range extender circuit..

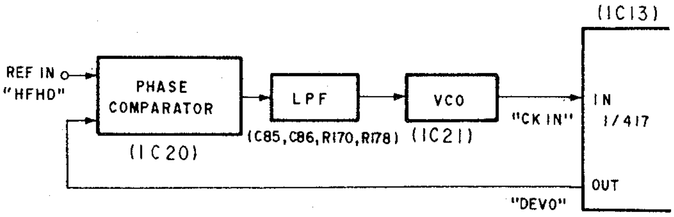


Fig. 10-8 Basic block diagram of PLL circuit

(1) Phase comparator ·· A high-speed digital circuit with narrow immune range is suitable. → IC20: CX3065A (SONY)

(2) LPF ·········· R170, C86, R178, and C85 are used.

(3) VCO ········· One with maximum frequency more than 60MHz, and wide range of oscillating frequency is suitable → IC21: SN74S124N (TI)

② Measures against jitters/noises in SYNC

Use of HD (HF.HD) derived from deflection system in place of input SYNC gives following merits:

- * Jitters/noise components are eliminated because HD (HF.HD) derives from a section after AFC circuit. This permits easy design on time constant of low-pass filter, and contributes to extension of lock range.
- * Characters displayed do not move relative to the screen if performed RGB-SHIFT adjustment.

③ Lock range extender circuit

With only one VCO, it is impossible to cope with the lock-in frequency range required. So, two VCOs (IC21 consists of two VCOs) are used, that is, one is used for high-band and the other for low-band. Switching between these two VCOs is done by a voltage comparator (IC22) and a flip-flop (IC23).

When f_H increases starting from 15 kHz, and control voltage V_C becomes higher than about 4.5V (Vth), voltage comparator-1 shown in the block diagram below is enabled. A flip-flop inverts, and switching from VCO-1 to VCO-2 occurs. When f_H decreases starting from 95 kHz, and control voltage V_C becomes lower than about 2.4V (V_{tl}), then voltage comparator-2 is enabled. Flip-flop inverts again, and switching from VCO-2 to VCO-1 occurs.

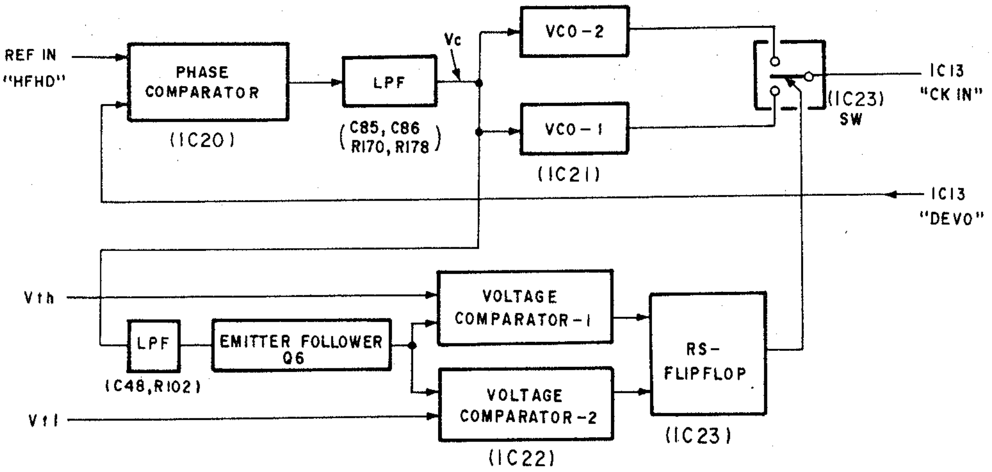

REF IN
"HFHD"
PHASE COMPARATOR
(IC20)
LPF
(C85, C86
R170, R178)
Vc
VCO-2
VCO-1
(IC21)
(IC23)
SW
IC13
"CK IN"
IC13
"DEVO"
Vth
LPF
(C48, R102)
EMITTER FOLLOWER
Q6
VOLTAGE COMPARATOR-1
VOLTAGE COMPARATOR-2
(IC22)
RS-FLIPFLOP
(IC23)
Vtl

Fig. 10-9 Block diagram of Automatic switching circuit of VCO

Lock-in correction waveform control described in the next section is also effective in extending lock range.

4. VD synchronizer (IC26, 27)

No restriction exists on phase relationship between HFHD and VD applied to Y board, and phase jitters by 4 μS. in maximum may occur by effects from a phase-shift circuit on DA board. Consequently, a possibility exists that V-jitters of characters or built-in test signals may occur.
Reason is, with phase relationship between HD and VD shown below, counting of scanning line counter (in IC13), which counts HD (this determines display position of characters or test signals such as hatch) and is cleared by VD, may fluctuate by one count.

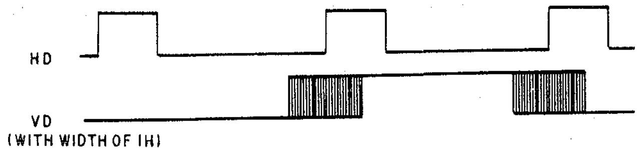

HD
VD
(WITH WIDTH OF 1H)

Fig. 10-10

If negative going edge of VD occurs while HD is High state, this circuit determines that HD and VD are in the timing relationship above, and delays timing of VD to be sent to IC13 by 5.4μS than that of VD input. Also, a circuit is added which cancels delaying VD timing if the IC determines that HD and VD are still in the timing relationship said above after delay of timing has been done. Block diagram Fig.10-10. shows the circuit.

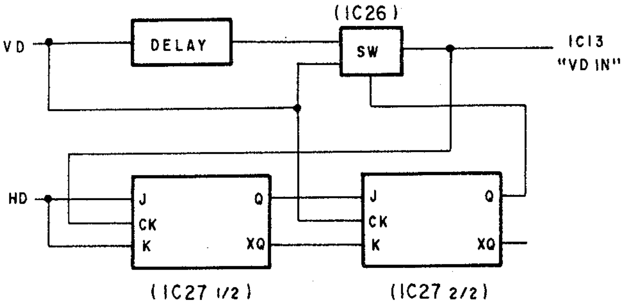

VD
DELAY
(IC26)
SW
IC13
"VD IN"
HD
J
CK
K
Q
XQ
(IC27 1/2)
J
CK
K
Q
XQ
(IC27 2/2)

Fig. 10-11

This circuit synchronizes VD with HD, and problem of character jitter is resolved.
Value of 5.4μsec. is determined based upon the minimum (about 10.9μsec at 92 kHz) of 1H time and the maximum (4μsec.) of jitter width.

5. TTL-ECL convertor (IC18, 19)

Signals of INT SG, character R/G/B, and BORDER (shadow of characters) are sent to circuit boards of signal system after converted to ECL level because these are high frequency signals.

3-10-8. 96 Pin Connector Interface

pin NO.	name	description	I/O	signal	level	Active state, etc. (SIRCS code: SC)
1a	+5V SUB	power line supplied at MAIN SW ON of main unit	I	DC	+5V	MAIN SW ON
1b	+5.7V	power line supplied at POWER SW ON of commander	I	DC	+5.7V	S. C. = $2E_H$
1c	+5.7V	ditto	I	DC	+5.7V	ditto
2a	+5V SUB	power line supplied at MAIN SW ON of main unit	I	DC	+5V	MAIN SW ON
2b	POWER CONT	control signal to power supply unit	O	DC	TTL	POWER ON: Low (S. C. = $2E_H$), POWER OFF: High (S. C. = $2F_H$)
3a	FAN PROT	FAN protector ON/OFF signal (from PA board)	I	DC	TTL	FAN's abnormal state (stop): Low
3b	D GND	GND to Y board				
3c	D GND	GND to Y board				
4a	D GND	GND to Y board				
4b	Σ Ik PROT	cathode current protector ON/OFF signal (from PA)	I	DC	TTL	abnormal (excessive) cathode current: High
4c	H STOP	H def. system protector ON/OFF signal (from PA)	I	DC	TTL	H deflection stop: High
5a	LENS PROT	not used	–	–	–	
5b	HV PROT	high voltage protector ON/OFF signal (from PA)	I	DC	TTL	abnormal condition in HV system: High
5c	V STOP	V def. system protector ON/OFF signal (from PA)	I	DC	TTL	V deflection stop: High
6a	GIN 2	not used	–	–	–	
6b	BIN 1	not used	–	–	–	
6c	BIN 2	not used	–	–	–	
7a	RIN1	not used	–	–	–	
7b	RIN 2	not used	–	–	–	
7c	GIN 1	not used	–	–	–	
8a	VD	v deflection signal	I	pulse	TTL	
8b	HFHD	H deflection signal (Half HD)	I	pulse	TTL	
8c	H. S (Y, DA)	H sync signal (from Y board to DA board)	O	pulse	TTL	
9a	V INV	floor/pendant/rear discrimination (V direction)	I	DC	TTL	
9b	V INV	floor/pendant/rear discrimination (H direction)	I	DC	TTL	

Table 10-6 (1/4)

pin NO.	name	description	I/O	signal	level	Active state, etc. (SIRCS code: SC)
9c	VS (Y, DA)	V-sync signal (from Y board to DA board)	O	pulse	TTL	
10a	SIRCS	SIRCS code line (from Y board to DA board)	I	pulse	TTL	
10b	S ON G	SYNC ON GREEN (composite sync signal of ext. input)	I	pulse	TTL	
10c	HS (BB, Y)	H-sync signal (ext. input signal) (from BB to Y)	I	pulse	TTL	regardless of polarity
11a	VS (BB, Y)	Y-sync signal (ext. input signal) (from BB to Y)	I	pulse	TTL	regardless of polarity
11b	CP	Clamp pulse	O	pulse	TTL	
11c	LED $\overline{\text{WR}}$	LED display (L board) ON/OFF (PORT/ERROR codes, etc.)	O	pulse	TTL	during data transfer to LED: Low
12a	D5	data (5th bit)	O	pulse	TTL	data value to digital ATT (L/DB/DC boards)
12b	D6	data (6th bit)	O	pulse	TTL	ditto
12c	D7	data (7th bit)	O	pulse	TTL	ditto
13a	D2	data (2th bit)	O	pulse	TTL	ditto
13b	D3	data (3th bit)	O	pulse	TTL	ditto
13c	D4	data (4th bit)	O	pulse	TTL	ditto
14a	DATT $\overline{\text{WR}}$	data transfer to digital ATT (on DB board) ON/OFF	O	DC	TTL	during data output: Low others: High
14b	D0	data (0th bit)	O	pulse	TTL	data value to digital ATT (L/DB DC boards)
14c	D1	data (1th bit)	O	pulse	TTL	ditto
15a	A5	address (5th bit)	O	pulse	TTL	address value to digital ATT (L/DB/DC boards)
15b	A6	address (6th bit)	O	pulse	TTL	ditto
15c	A7	address (7th bit)	O	pulse	TTL	ditto
16a	A2	address (2nd bit)	O	pulse	TTL	ditto
16b	A3	address (3rd bit)	O	pulse	TTL	ditto
16c	A4	address (4th bit)	O	pulse	TTL	ditto
17a	HD	H-deflection signal	I	pulse	TTL	
17b	A0	address (0th bit)	O	pulse	TTL	address value to digital ATT (L/DB/DC boards)
17c	A1	address (1st bit)	O	pulse	TTL	ditto

Table 10-6 (2/4)

pin NO.	name	description	I/O	signal	level	Active state, etc. (SIRCS code: SC)
18a	D GND	GND to Y board				
18b	D GND	ditto				
18c	D GND	ditto				
19a	NC	not used				
19b	FAC (NC)	not used				
19c	CODE 3	input signal discrimination	I	DC	TTL	
20a	V. IN SEL	Select the signal connected to Video input, or not	O	DC	TTL	NOTE 1
20b	VID/$\overline{\text{OTHER}}$	Input is Video signal, or the signal other than Video	I	DC	TTL	Video: High, Others: Low
20c	$\overline{\text{SEL 2}}$	choose SLOT-B as Input Select, or not	O	DC	TTL	NOTE 1
21a	$\overline{\text{SLOT SEL}}$	choose SLOT-A/B as Input Select, or not	O	DC	TTL	NOTE 1
21b	$\overline{\text{SEL 1}}$	choose SLOT-B as Input Select, or not	O	DC	TTL	NOTE 1
21c	GBR/$\overline{\text{Y. PB. PR}}$	control to input process circuit on HCTV signal board	O	DC	TTL	GBR: High, Y. PB. PR: Low
22a	TRI/$\overline{\text{NOT}}$	Input signal has 3-value sync, or not (from BB)	I	DC	TTL	3-value ysnc: High, 2-value sync: Low
22b	COLOR/$\overline{\text{BW}}$	control to input process circuit on HCTV signal board	O	DC	TTL	COLOR: High, BLACK & WHITE: Low
22c	$\overline{\text{SECAM ON}}$	forced SECAM function ON/OFF	O	DC	TTL	SECAM ON: Low (S. C. = 27H)
23a	$\overline{\text{CLEAR BLUE}}$	CLEAR BLUE function ON/OFF	O	DC	TTL	CLEAR BLUE ON: Low (S. C. = 28H)
23b	CODE 2	B&W, NTSC-PAL, SECAM discrimination signal	I	DC	TTL	NOTE 2
23c	CODE 1	ditto	I	DC	TTL	NOTE 2
24a	VIDEO/$\overline{\text{YC}}$	Selected Video signl = composite video, or YC?	I	DC	TTL	VIDEO: High, YC: Low
24b	$\overline{\text{DVS}}$/NVS	2-step switching of V-SHIFT circuit's variable range	O	DC	TTL	V-SHIFT "NARROW": High, "WIDE": High
24c	ON/$\overline{\text{OFF}}$ (B)	Cut off Blue CRT, or not	O	DC	TTL	CUR OFF: Low
25a	RFB/$\overline{\text{VIDEO}}$	Selected Video Signal = RFV signal, or VIDEO?	I	DC	TTL	RGB: High, VIDEO: Low
25b	ON/$\overline{\text{OFF}}$ (R)	Cut off Red CRT, or not	O	DC	TTL	CUT OFF: Low
25c	ON/$\overline{\text{OFF}}$ (G)	Cut off Green CRT, or not	O	DC	TTL	CUT OFF: Low
26a	RX	input from RS422 terminal	I	pulse	TTL	
26b	$\overline{\text{RX}}$	ditto (inverted RX)	I	pulse	TTL	

Table 10-6 (3/4)

pin NO.	name	description	I/O	signal	level	Active state, etc. (SIRCS code: SC)
26c	INT/$\overline{\text{EXT}}$	ext. sync mode, or int. sync mode	O	DC	TTL	ext. sync mode: Low, int. sync. modee: High
27a	TX	output to RS422 terminal	O	pulse	TTL	
27b	$\overline{\text{TX}}$	ditto (inverted TX)	O	pulse	TTL	
27c	DE det	DD/DE boards are installed, or not	I	DC	TTL	DD/DE boards are installed: Low
28a	PL	gate pulse to dark portion of PLUGE signal	O	pulse	TTL	PL output: Low
28b	PH	gate pulse to bright portion of PLUGE signal	O	pulse	TTL	PH output: High
28c	NORM/$\overline{\text{TEST}}$	TEST mode (int. TEST sig. output), or NORM mode	O	DC	TTL	TEST mode: L (S. C. = 7EH), NORM mode: H (S. C. = 7DH)
29a	SG	internal TEST signal output	O	pulse	ECL	100 IRE: High, 0 IRE: Low
29b	$\overline{\text{SG}}$	ditto (inverted SG)	O	pulse	ECL	100 IRE: Low, 0 IRE: High
29c	$\overline{\text{RCHA}}$	character display (red) output (inverted RCHA)	O	pulse	ECL	100 IRE: Low, 0 IRE: High
30a	CBRT	gate pulse output to darken screen except cursor area	O	pulse	ECL	cursor area: High (normal), others: Low
30b	$\overline{\text{CBRT}}$	ditto (inverted CBRT)	O	pulse	ECL	cursor area: Low (normal), others: High
30c	RCHA	character display (red) output	O	pulse	ECL	100 IRE: High, 0 IRE: Low
31a	BORDER	character (shadow area) output	O	pulse	ECL	character (including shadow): H, others: L
31b	$\overline{\text{BORDER}}$	ditto	O	pulse	ECL	character (including shadow): L, others: H
31c	GCHA	character display (green) output	O	pulse	ECL	100 IRE: High, 0 IRE: Low
32a	BCHA	character display (blue) output	O	pulse	ECL	100 IRE: High, 0 IRE: Low
32b	$\overline{\text{BCHA}}$	character display (blue) output	O	pulse	ECL	100 IRE: Low, 0 IRE:High
32c	$\overline{\text{GCHA}}$	character display (green) output	O	pulse	ECL	100 IRE: Low, 0 IRE:High

NOTE 1

terminal output signal	V-SEL	$\overline{\text{SLOT SELECT}}$	$\overline{\text{SEL 1}}$	$\overline{\text{SEL 2}}$
CCQ	Low	High	High	High
VIDEO	High	High	High	High
SLOT-A	Low	Low	Low	High
SLOT-B	Low	Low	High	Low

NOTE 2

terminal output signal	CODE 1	CODE 2
CCQ	Low	Low
VIDEO	Low	High
SLOT-A	High	Low
SLOT-B	High	High

Table 10-6 (4/4)

3-11. CIRCUIT OPERATION OF KA BOARD

On BB board, AUDIO signal receives control to its level and enters to KA board from pin ① of connector KA-502. On KA board, AUDIO signal passes a buffer (Q502) and enters to an amplifier (IC501, μPC1241H) which directly drives a speaker. The speaker's negative terminal is connected to −15V line because this IC operates on (−15V) and (GND) power supply. Care must be paid ↗ when you connect oscilloscope probes to speaker terminals because this may short-circuit between −15V and GND if other GND probe of the oscilloscope is connected to GND. Q501 is series regulator transistor which prevents ripple component on power line being heard from speaker as hum noise.

3-12. CIRCUIT OPERATION OF BC BOARD

3-12-1. SIRCS signal filter circuit (IC102 to 104, Q102, 103)

SIRCS signals, sent from SIRCS receiver boards (NA, NB) on projector's main unit, enter to BC board via pin 8a and pin 8c of connector BC-1, respectively. Polarity of signals is negative. These signals pass filter circuits. Because these filter circuits are of same configuration, only description of NA board is given here.

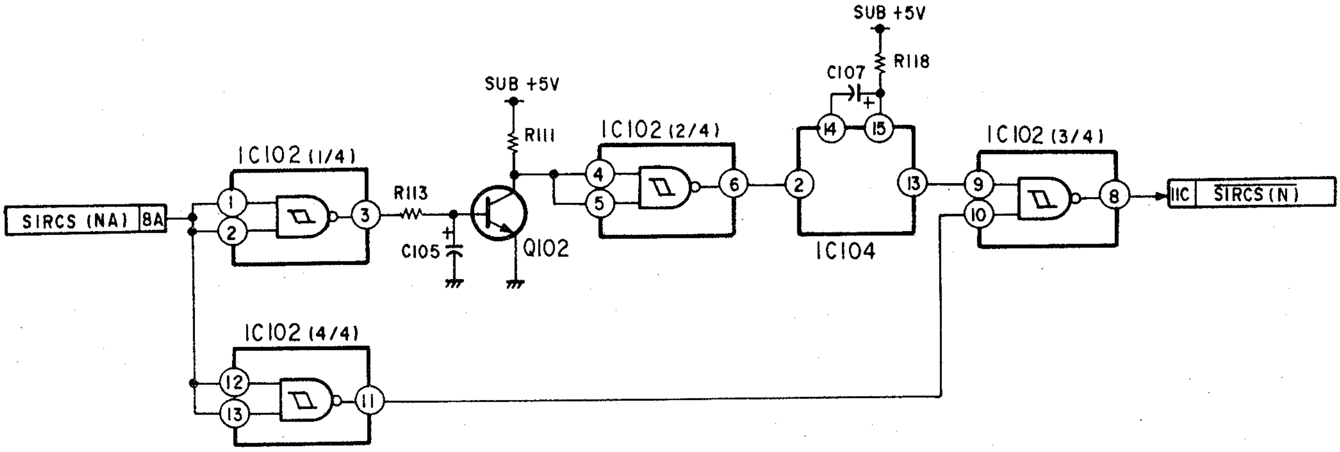


Fig. 12-1

The filter circuit prevents input signal from being sent to BB board if noises other than SIRCS signal (e.g., noise from fluorescent lamps) are coming in.

If input signal is a SIRCS signal, it is inverted in IC102 (1/4). This starts charging to C105, and Q102 is turned ON. IC102 (2/4) inverts this again, and triggers IC104. IC104 generates positive gate pulse with width of 155 msec., and outputs it from pin ⑬. Only when output from pin ⑬ of IC104 is High, IC102 outputs SIRCS signal inverted by IC102 (4/4) from its pin ⑧.

If input signal is narrow noises other than SIRCS signal, charging to C105 does not occur and Q102 is not turned ON. So, no output appears from pin ⑧ of IC102.

After passed filters, NA and NB signals are ORed by D103 and D104, then sent to BB board.

3-12-2. SIRCS signal switching circuit (IC101, Q101)

This circuit sends SIRCS signal, which processed on INDEX board, to Y board when INDEX board is installed on SLOT A or SLOT B.

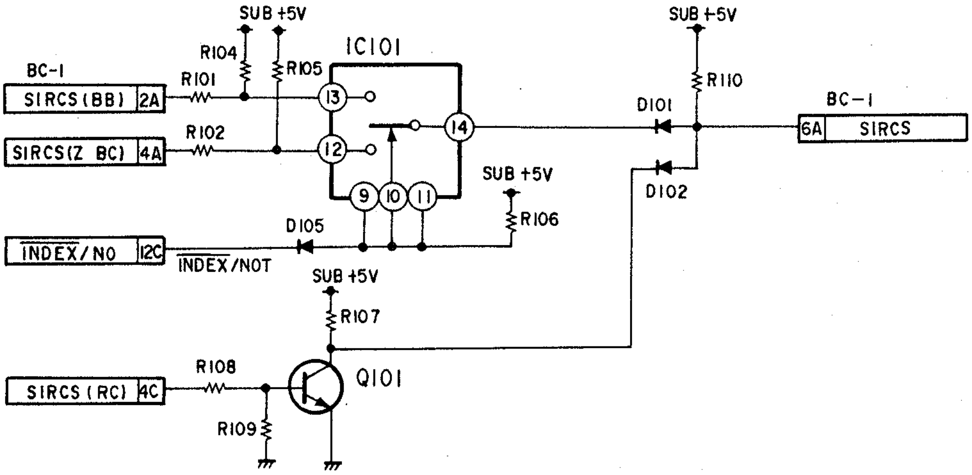

SUB +5V
R104
IC101
BC-1
R101
R105
SIRCS (BB) 2A
13
R102
SIRCS (Z BC) 4A
12
14
9
10
11
D105
INDEX/NO 12C
INDEX/NOT
SUB +5V
R106
SUB +5V
R107
R108
SIRCS (RC) 4C
Q101
R109
SUB +5V
R110
D101
D102
BC-1
6A SIRCS

Fig. 12-2

IC101 outputs SIRCS signal, which is processed in BB board and applied on its pin ⑬, from its pin ⑭ if pin 12c of connector BC-1 is OPEN state in normal state of operation. If INDEX board is installed, however, pin 12c is pulled down to GND. In this case, IC101 outputs the signal applied on its pin ⑫, that is, SIRCS signal sent from INDEX board. Also, to make control from the commander of main unit effective when INDEX board is installed, following 2 signals are ORed by D101 and D102, then sent to Y board:

(1) signal switched by IC101
(2) SIRCS signal from the commander of main unit (positive polarity) entered from pin 4c of connector BC-1 and inverted by Q101

3-12-3. INPUT A/B signal switching circuit (RY101 to 103, Q104, 105)

This circuit selects a signal from the one entered from SLOT A or the one entered from SLOT B.

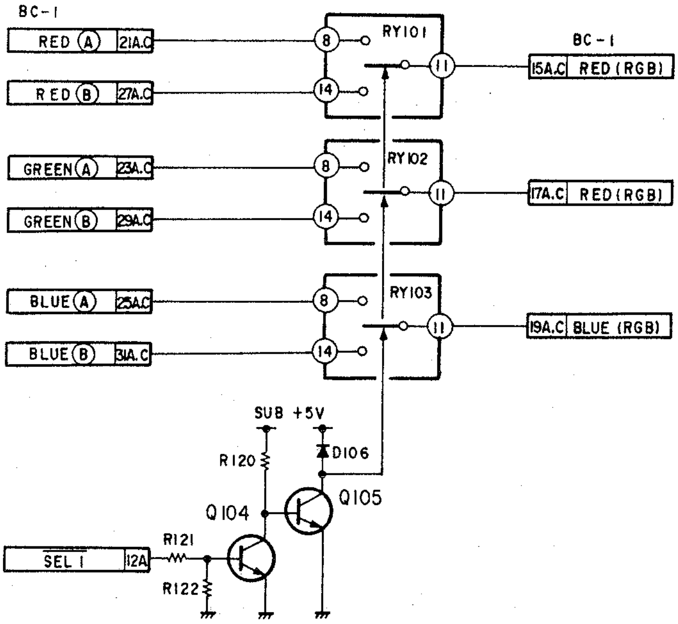

BC-1
RED (A) 21A.C
RED (B) 27A.C
RY101
8
14
11
BC-1
15A.C RED (RGB)
GREEN (A) 23A.C
GREEN (B) 29A.C
RY102
8
14
11
17A.C RED (RGB)
BLUE (A) 25A.C
BLUE (B) 31A.C
RY103
8
14
11
19A.C BLUE (RGB)
SUB +5V
R120
D106
Q104
Q105
R121
SEL 1 12A
R122

Fig. 12-3.

SEL 1 on pin 12a of connector BC-1 becomes Low when selected SLOT A, or becomes High (+5V) when selected SLOT B. Q104 and Q105 is used to convert these Low/High signals into current sufficient enough to switch RY101 to RY103.
Relays switch to pin ⑧ when INPUT A is selected, and to pin ⑭ when INPUT B is selected to send the selected signal to BB board.

3-13. CIRCUIT OPERATION OF L BOARD

3-13-1. Protector code

This projector is equipped with a self-diagnostics system for analysis of major failures. In this system, ON/OFF signal from failed section is sent to PROTECTOR circuit and CPU simultaneously. PROTECTOR circuit turns the projector OFF, and CPU outputs data corresponding to the failed section onto 8-bit data bus. Connector L301 is the input to this 8-bit data bus.

IC301 is a buffer. IC302 and IC303 are drive circuits to drive indicator IC304. Thus, failure modes are displayed on IC304.

Mode of failure is displayed on 2-digits of 7-segment LEDs. LEDs on Y board is also turned ON when one of these failure code is displayed.
For details (i.e., failure codes, etc.), refer to 3-114. Self-Diagnostics section.

3-14. SELF-DIAGNOSTICS(TROUBLESHOOTING)

3-14-1. Self-diagnostics

This projector is equipped with a LED display on L board to permit smooth analysis of failure.

Display on LED is in hexadecimal, and Table 16-1. shows relationship between display codes and failure modes.
"01", "02", "04", "08", "10" and "20" indicate independent failure mode, respectively. Other codes are combinations of these independent failure modes.

1. Contents of failure modes

(a) "01" – FAN STOP

At least one of 6 FANs (two for power supplies) used in this projector failed: Failure may exists in FAN itself, or disconnection of a FAN connector.

NOTE:
FAN PROTECTOR does not operate at disconnection of small micro-FAN's connector.

(b) "02" – H STOP (100V down)

H deflection stops because of failure on E board or on other boards: Failure may exists in damaged Hout transistor (Q7 on E board).
Voltage building-up on +100V line is unsuccessful because of damaged transistors (Q10 or Q11) on PA board.

(c) "04" – Σ Ik OVER

Abnormal (excessive) current in CRT: The PROTECTOR is activated at about 4.3mA or more of total cathode current. Failure may exist in failed Video OUT transistors (IC101, IC201, IC301) on CARG/CAB boards, damaged CRT, damaged FBT, or too-high setting of G2 (SCREEN) potentiometer.

(d) "08" – V STOP

V deflection stops because of failure on DC board or other boards (DA or DB, for example):
Failure may exist in damaged Vout ICs (IC4, IC6, IC8) on DC board, etc.
Overload to ± 15V lines on DC board: Failure may exist in damaged Sub-deflection circuit on DC board, or in over correction to registration (*1).

* 1: If installation of the projector system is incorrect against projector's optical system, and if you perform adjustments of registration forcibly, then overload to ± 15V lines may occur.

(e) "10" – HV OVER

High-voltage (HV) becomes excessive: PROTECTOR is activated at HV = 34kV (± 0.3kV). Failure may exist damaged CRT, or damaged HV regulator circuit on PA board.

(f) "20" – POWER DOWN

POWER is turned OFF without control from the commander:
Overload to power supply may cause PROTECTOR in power supply to be activated.

NOTE:
If PROTECTOR in power supply is activated, and POWER to the projector is turned OFF, POWER CONT. line in the projector (POWER ON at High (5V), and POWER OFF at Low (0 V)) remains High state (5V). To turn POWER to the projector ON again, press Power Off key on the commander to pull down POWER CONT. line to Low (0 V) state. Then press Power ON key on the commander.

(g) Failure Display

code	FAN stop	H stop (100V down)	IK over	V stop	HV over	power down
01	*	–	–	–	–	–
02	–	*	–	–	–	–
03	*	*	–	–	–	–
04	–	–	*	–	–	–
05	*	–	*	–	–	–
06	–	*	*	–	–	–
07	*	*	*	–	–	–
08	–	–	–	*	–	–
09	*	–	–	*	–	–
0A	–	*	–	*	–	–
0b	*	*	–	*	–	–
0C	–	–	*	*	–	–
0d	*	–	*	*	–	–
0E	–	*	*	*	–	–
0 _....	*	*	*	*	–	–
10	–	–	–	–	*	–
11	*	–	–	–	*	–
12	–	*	–	–	*	–
13	*	*	–	–	*	–
14	–	–	*	–	*	–
15	*	–	*	–	*	–
16	–	*	*	–	*	–
17	*	*	*	–	*	–
18	–	–	–	*	*	–
19	*	–	–	*	*	–
1A	–	*	–	*	*	–
1b	*	*	–	*	*	–
1C ...	–	–	*	*	*	–
1d	*	–	*	*	*	–
1E	–	*	*	*	*	–
1 _....	*	*	*	*	*	–
20	–	–	–	–	–	*

Table 14-1

2. RS422 communication error code

If errors occur in RS422 communication, display different from that of failure modes appears. Display codes and their contents are as follows:

A0: Receive time out error
Too long time interval between received Bytes: (Transmit/Receive data of RS422 requires 3 Bytes per instruction. Error occurs if time interval between Bytes of received data is too long.)

A1: Handshake error
Discrepancy exists in timing of data transfer with MASTER side.

A2 to AF: Combination of following modes
Table 14-2 shows relationship between codes and combination modes.

Over Run Error
Next data arrives before completion of reading current data.

Parity Error
Parity (odd/even) bit error.

Framing Error
No stop bit is detected.

	Over Run Error	Parity Error	Framing Error
A2	–	–	*
A4	–	*	–
A6	–	*	*
A8	*	–	–
AA	*	–	*
AC	*	*	–
AE	*	*	*

Table 14-2

Software for normal operation is not affected while error codes are displayed.
Error codes are turned OFF if normal communication is done next time.

3-14-2. Power ON/OFF and Protector Line

1. Power ON/OFF
Power ON/OFF control from the remote commander is done by "POWER CONT." line be pulled-up (High) or pulled-down (Low) (refer to 14-2 Power cont and prot line diagram).

Power CONT. → { High (≒ 5V) → Power ON
Low (≒ 0V) → Power OFF

When the remote commander outputs SIRCS code of "POWER ON", the code passes a signal route shown in Fig. 2-1, then enters to IC9 on Y board. The IC decodes the SIRCS code, and pulls pin ㉘ ($\overline{\text{Power}}$) down to Low (≒ 0 V). Low state on pin ㉘ turns Q3 ON, and "POWER CONT." line becomes High. This turns Q251 ON, and POWER to the projector is turned ON (refer to Fig. 14-2). Sequence of Power Off is the one completely reversal to that of Power On.

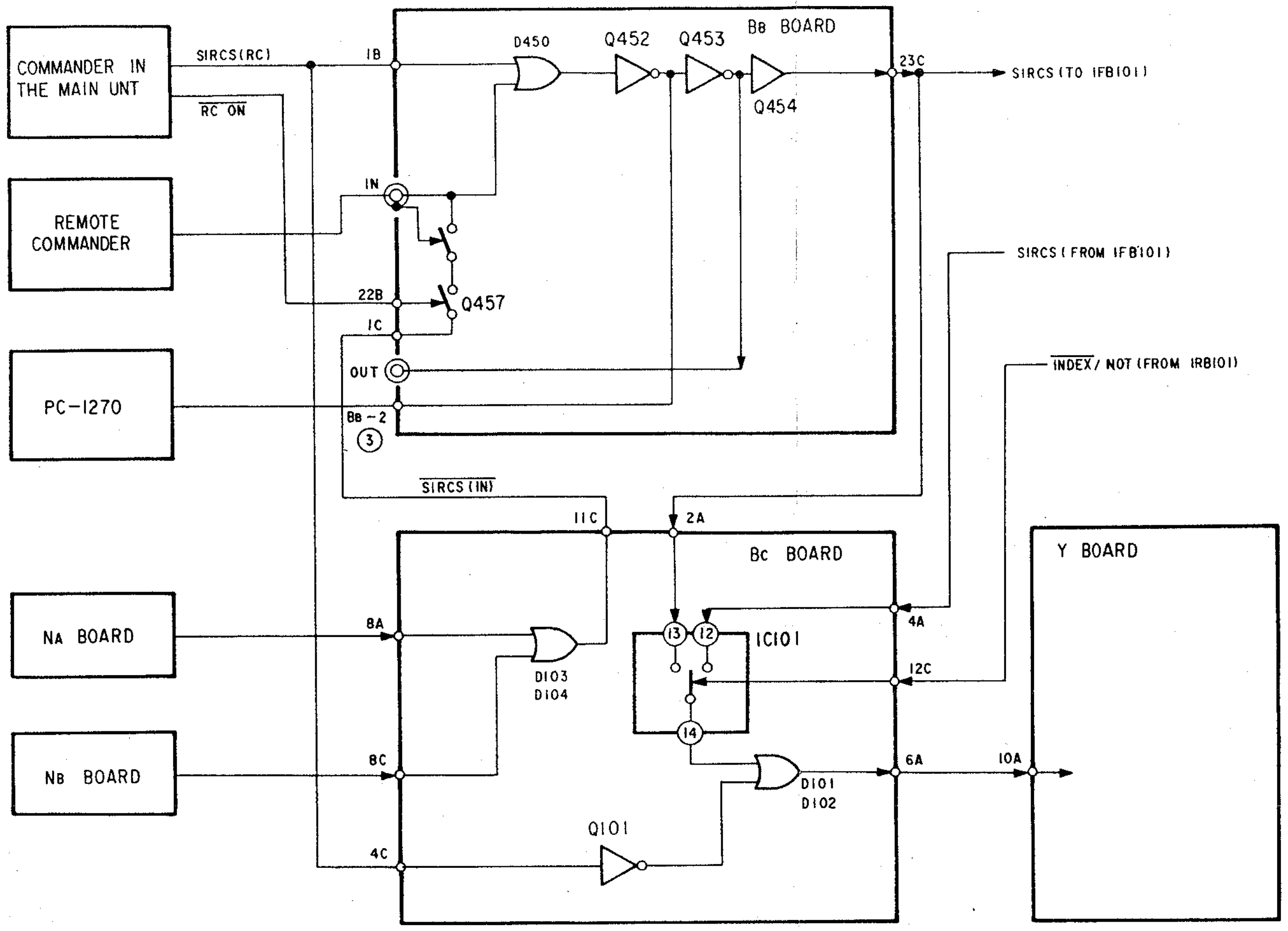

COMMANDER IN THE MAIN UNT
SIRCS(RC)
RC ON
REMOTE COMMANDER
PC-1270
NA BOARD
NB BOARD
BB BOARD
D450
Q452
Q453
Q454
1B
IN
22B
Q457
1C
OUT
BB-2
③
23C
SIRCS (TO IFB101)
SIRCS (FROM IFB101)
INDEX/ NOT (FROM IRB101)
SIRCS (IN)
11C
2A
BC BOARD
8A
D103
D104
8C
4C
Q101
⑬
⑫
IC101
⑭
4A
12C
6A
D101
D102
10A
Y BOARD

Fig. 14-1 SIRCS line diagram

In addition to control from the remote commander, Power off operation is enabled if something wrong occurs in the projector (refer to Fig. 14-2).
PA board, CA(RG) board, BA/BB boards, and IFB board contain transistors to pull down "POWER CONT." line Low forcibly. If something wrong occurs, these transistors are turned ON to pull down "POWER CONT." line, and the projector is turned OFF.

board	Ref.	function
PA board	Q15	Turns ON when protector is activated
CA(RG) board	Q2, Q4	Turn ON when voltage building-up on ± 12V power lines is unsuccessful.
BA board	Q25	
BB board	Q404, 405	
IFB board	–	

2. Protector line

There are five protector lines as shown below, and they are in 1-by-1 correspondence with failure modes:

1. FAN STOP line
2. H STOP (100V down) line
3. Σ Ik OVER line
4. V STOP line
5. HV OVER line

Signal polarity on each protector line is normally Low (≒ 0V) except FAN STOP line which is normally High (≒ 5V).

	normal state	abnormal state
1. FAN STOP	High	Low
2. H STOP (100V down)	Low	High
3. Σ Ik OVER	Low	High
4. V STOP	Low	High
5. HV OVER	Low	High

Signal levels on these lines are all entered to PA board and Y board. Signals entered to PA board are ORed (∗1) to turn Q15 ON, and turns the projector OFF. Y board monitors abnormal state on signal levels, and sends data to L board to display failure modes.

∗ 1: Signals are ORed by D24, 25, 28 and 29 on PA board. But signal polarity on FAN STOP line is reversal to other lines. So, Q17 inverts the signal on FAN STOP line before the signal is mixed.

Here is description when H. STOP protector is activated, as an example..

If some failure occurs in E board, and H deflection stops, then Q115 on E board is turned OFF, and H. STOP line is pulled up to High (≒ 5V). Y board detects the High state on H. STOP line, and sends data to L board to display "02" on LEDs of L board. On the other hand, D24 and Q16 become High, and Q15 is turned ON. This forcibly pulls down "POWER CONT." line to Low, and the projector is turned OFF.

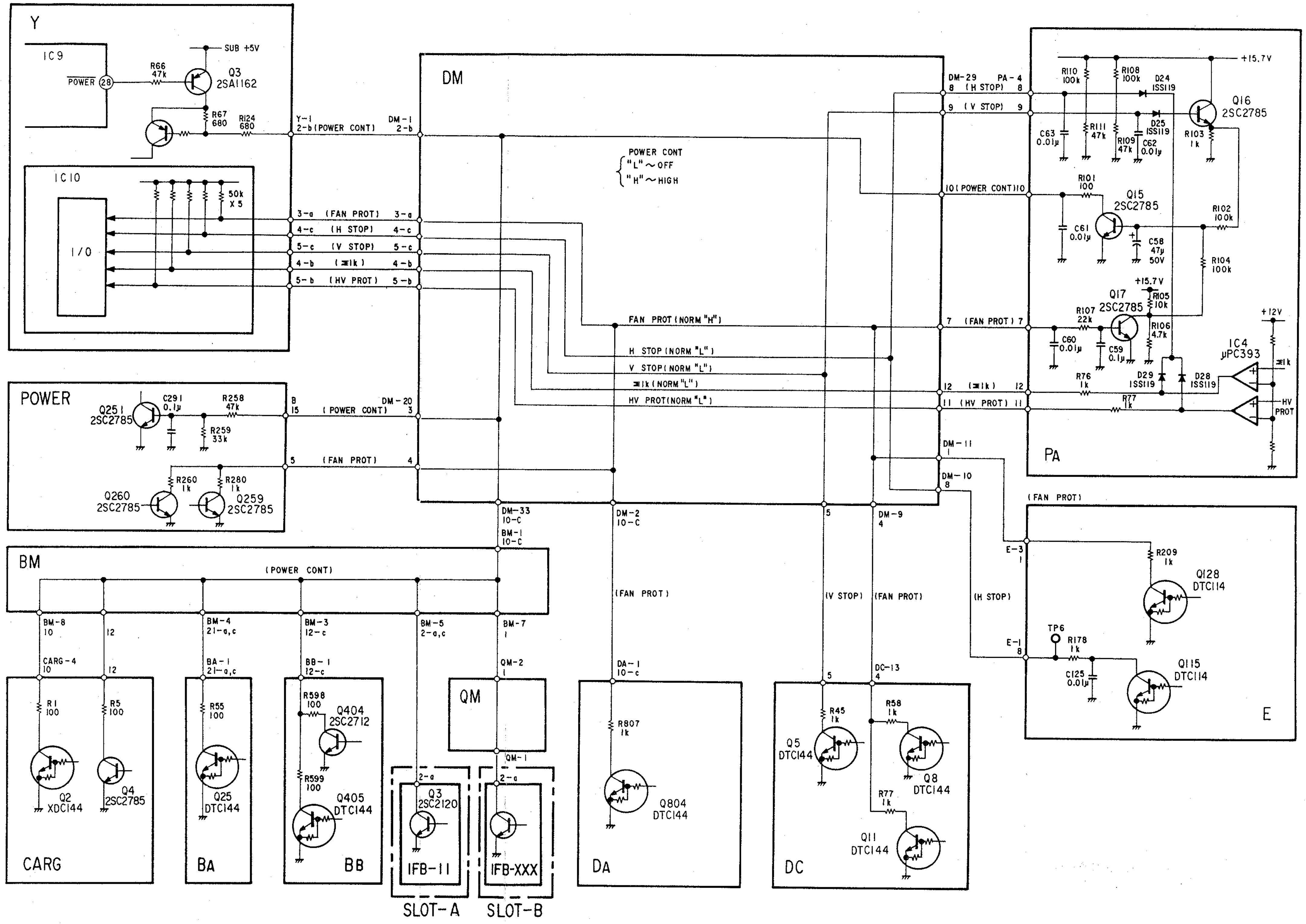

Y
IC9
POWER 28
R66 47k
Q3 2SA1162
SUB +5V
R67 680
R124 680
IC10
I/O
50k X5
Y-1 2-b (POWER CONT) DM-1 2-b
3-a (FAN PROT) 3-a
4-c (H STOP) 4-c
5-c (V STOP) 5-c
4-b (ΣIk) 4-b
5-b (HV PROT) 5-b
DM
POWER CONT
"L" ~ OFF
"H" ~ HIGH
FAN PROT (NORM "H")
H STOP (NORM "L")
V STOP (NORM "L")
ΣIk (NORM "L")
HV PROT (NORM "L")
POWER
Q251 2SC2785
C291 0.1μ
R258 47k
R259 33k
B 15 (POWER CONT) DM-20 3
5 (FAN PROT) 4
Q260 2SC2785
R260 1k
R280 1k
Q259 2SC2785
DM-33 10-C
BM-1 10-C
DM-2 10-C
BM
(POWER CONT)
BM-8 10
BM-4 21-a,c
BM-3 12-c
BM-5 2-a,c
BM-7 1
CARG-4 10
R1 100
R5 100
Q2 XDC144
Q4 2SC2785
CARG
BA-1 21-a,c
R55 100
Q25 DTC144
BA
BB-1 12-c
R598 100
Q404 2SC2712
R599 100
Q405 DTC144
BB
QM-2 1
QM
QM-1
2-a
Q3 2SC2120
IFB-11
IFB-XXX
SLOT-A
SLOT-B
(FAN PROT)
DA-1 10-c
R807 1k
Q804 DTC144
DA
(V STOP)
(FAN PROT)
DC-13 4
R45 1k
Q5 DTC144
R58 1k
Q8 DTC144
R77 1k
Q11 DTC144
DC
DM-29 8 (H STOP) PA-4 8
9 (V STOP) 9
10 (POWER CONT) 10
7 (FAN PROT) 7
12 (ΣIk) 12
11 (HV PROT) 11
DM-11 1
DM-10 8
DM-9 4
+15.7V
R110 100k
R108 100k
D24 1SS119
Q16 2SC2785
C63 0.01μ
R111 47k
D25 1SS119
R109 47k
C62 0.01μ
R103 1k
R101 100
Q15 2SC2785
R102 100k
C61 0.01μ
C58 47μ 50V
R104 100k
Q17 2SC2785
R105 10k
R107 22k
R106 4.7k
C60 0.01μ
C59 0.1μ
+12V
IC4 μPC393
R76 1k
D29 1SS119
D28 1SS119
R77 1k
ΣIk
HV PROT
PA
(FAN PROT)
(H STOP)
E-3 1
E-1 8
R209 1k
Q128 DTC114
TP6
R178 1k
C125 0.01μ
Q115 DTC114
E

Fig. 14-2 Power cont and prot line diagram

3-15. SOPS-1037

This power supply consists of two half-bridge converters and a self-excited flyback converter (auxiliary power supply).
If the main switch is turned ON, the auxiliary power supply starts its operation first. This supplies voltage to C1 and C2 boards on M1 board,and control IC (IC51) for C1/C2 is enabled. The power supply does not operate at this moment. Power supply on M2 board starts its operation when external ON signal (about 5V) is supplied. When the power supply on M2 board starts its operation and voltage is supplied, a part of which is supplied to pin ③ of C1 board mounted on M1 board. This is ON signal, and the power supply on M1 board starts its operation.

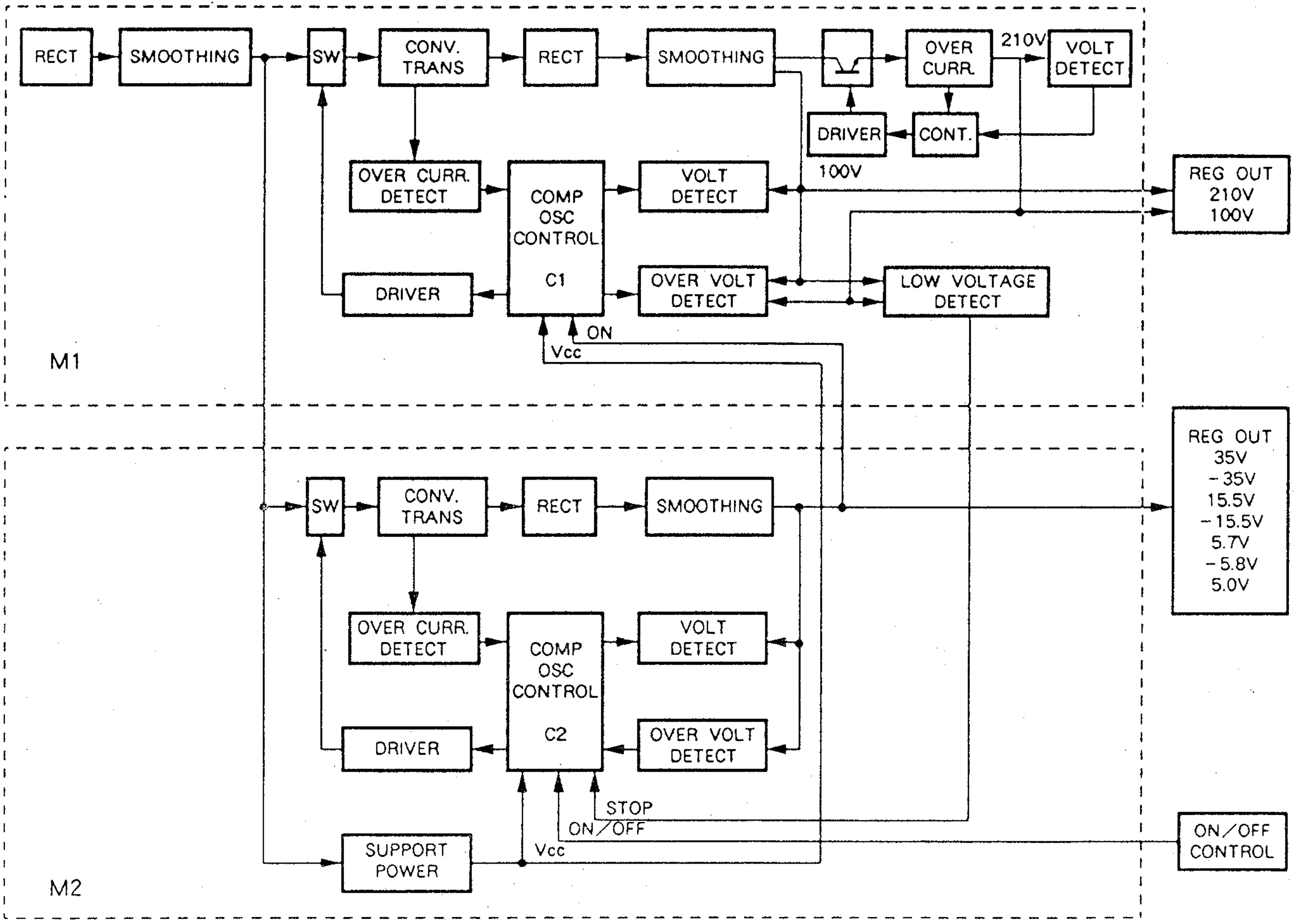

RECT
SMOOTHING
SW
CONV. TRANS
RECT
SMOOTHING
OVER CURR.
210V
VOLT DETECT
DRIVER
CONT.
100V
OVER CURR. DETECT
COMP OSC CONTROL C1
VOLT DETECT
DRIVER
OVER VOLT DETECT
LOW VOLTAGE DETECT
ON
Vcc
M1
REG OUT 210V 100V
SW
CONV. TRANS
RECT
SMOOTHING
OVER CURR. DETECT
COMP OSC CONTROL C2
VOLT DETECT
DRIVER
OVER VOLT DETECT
STOP
ON/OFF
Vcc
SUPPORT POWER
M2
REG OUT 35V -35V 15.5V -15.5V 5.7V -5.8V 5.0V
ON/OFF CONTROL

Fig. 15-1

3-15-1. C2 board (control board)

Pin ① and pin ② are input terminals of an error amplifier IC51 which controls output voltage. 5.7V output is divided by R71, R270 and RV251,then is entered to pin ① of IC51. Voltage (5V) supplied from pin ⑭ is divided by R62 and R63, then is entered to pin ② . Pin ④ is "dead-time control" terminal. If this terminal is in "High" state, then ON duty becomes zero.

If ON signal is in "Low" state (ON signal enters via Q251 and Q258), the power supply does not work because pin ④ is held in "High" state. Oscillation frequency is determined by pin ⑤ and pin ⑥ . Pins ⑧ , ⑨ , ⑩ and ⑪ are terminals for output transistor of IC51, and drive the main transistor via T153 and T154. Pin ⑫ is input terminal. Pin ⑭ is reference voltage (5V) output terminal. Pin ⑮ and pin ⑯ are input terminals of an error amplifier for over current protection. Voltage detected by T152 is rectified by D51, 52, 53 and 54, and after filtered by L1 and C53, it enters to pin ⑯.

3-15-2. M2 board

C152, 153, 166, 167, and Q151, 152, and T152 are half-bridge converter. AC voltage output from T151 is rectified by D251, 252, 253, 254, 255 and 256, then filtered by L251, 252, 253, and C265, 266, 267, 268 and 270. D276, 277, 278, 279, and R256, 266, 261, 263 and IC252 are over-current protection circuit. If each output voltage exceeds the reference voltage, pin ① or pin ⑦ of IC252 becomes "High" state. This "High" state is entered to pin ⑨ of IC2, and causes D58 to be turned ON, and Q53 also to be turned ON. Pin ④ of IC5 becomes "High" state, and the converter stops its operation.

3-15-3. C1 board (control board)

Operation on this board is same with that on C2 board.

3-15-4. M1 board

C109, 110, 111, 112, and Q101, 102, 103, and T101 are half-bridge converter circuit. AC voltage output from T101 is rectified by D201, 202, 203, 204, 205 and 206, and filtered by C201, 202, 213, 214, 215 and 216.

Q204, 205, and R232, 233, and Q206, 207, and R234, 235, 236 are over-current protection circuit.

With 10V output, if the voltage divided by R232 and R233 exceeds 5V, Q204 is turned ON, and "High" signal is entered to pin ⑨ of C1 board. This causes D58 to be turned ON, and Q53 also to be turned ON. Pin ④ of IC51 become "High" state, and the converter stops its operation.

IC203, and R247, 248, 249, 250, 251 are low-voltage protection circuit. With 100V output, voltage divided by R247 and R248 is entered to pin ⑥ of IC203 to compare it to the reference voltage on pin ⑤ . If voltage on pin ⑥ drops lower than that on pin ⑤ , "High" signal is output from pin ⑦ and is entered to pin ③ . C227 and R241 is a delay circuit. Pin ① outputs "High" signal. This passes M2 board, and is applied to pin ⑨ of C2 board, then the converter stops its operation.

R201, IC201, R217, 218, and RV202 are series voltage regulator.

R208, 209, 210, 212, 213, 214, 215, 254, and RV201 are over-current protection circuit.

SECTION 4

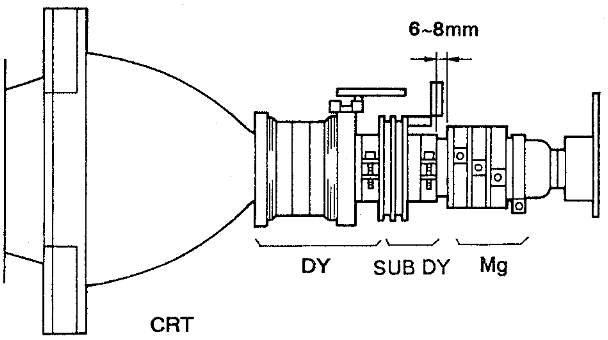
SET-UP ADJUSTMENTS

Note:

- When exchanging CRT, fit tightly DY to CRT, set neck assembly position and adjust.
- Service mode is released when the power is turned OFF.

4-1. NECK ASSEMBLY INSTALLATION

1. Fit DY tightly to CRT funnel first and then tightly fit Sub DY.
2. Temporary install 2-pole and 4-pole magnet assembly 6~8mm away from left DY.
3. Installing CB board.



4-2. DISPLAY INCLINATION ADJUSTMENT BY MAIN DY

1. Turn on the power switch of the set and the power key of the remote commander.
2. Press the TEST key for five seconds, and press the arrow ▲ key to set the service man mode.
3. Press SKEW, and use the ▲ and ▼ keys to set the V direction data of R, G, B to "128".

R ┬ H: – –
  └ V: 128

G ┬ H: – –
  └ V: 128

B ┬ H: – –
  └ V: 128

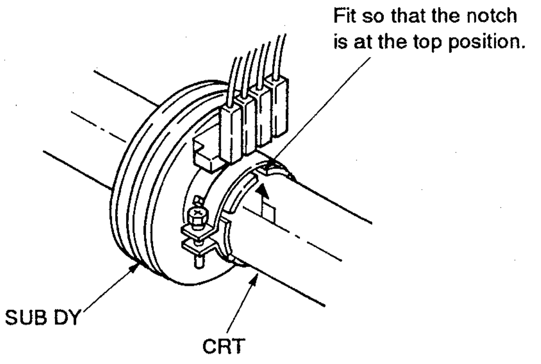
4. Rotate the main DY, and adjust the inclination of the display.
   - If the red CRT has been replaced, output the green and red cross hair patterns, and adjust the horizontal lines of the cross hair pattern to the green CRT which have been adjusted.
   - If the green or blue CRT have been replaced, output the cross hair patterns as above, and output the two colors of the CRT that was replaced and other CRT which have been adjusted, and adjust the horizontal lines of the cross hair pattern to the CRT which have been adjusted.
5. Secure the main DY in place after completing the adjustments.

Note 1. Be sure to adjust the main DY after the V direction data of SKEW has been adjusted to "128".

Note 2. Adjust so that the horizontal lines of the cross hair pattern coincide. (The vertical lines are adjusted during SKEW adjustments, after the main DY has been adjusted.)

4-3. SUB-DY ADJUSTMENT

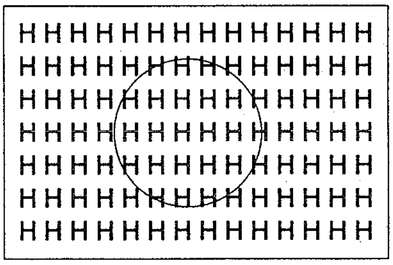
1. Fit to main DY and set at the mechanical center.

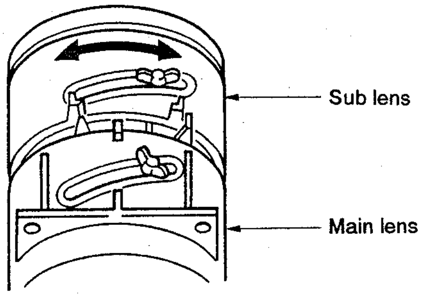


4-4. GREEN LENS FOCUS ADJUSTMENT

1. Use the commander to select an input not connected to a signal, and set it into a non signal condition. (To set f_H=34 kHz.)
2. Press the TEST key for five seconds, and press the ▲ key next to set the service man mode. (Not required when already in the service man mode).
3. Press the TEST key, and output the H pattern.
4. Adjust "CONTR" and "BRT" of PICTURE CONTROL, and set CONTR: 50 BRT: 50.
5. Press the CUT OFF R and B keys, and set to green (single color).
6. Loosen the screw of the main lens of green, rotate the lens so that the H pattern at the center of the screen becomes the clearest, and tighten the screw once more.

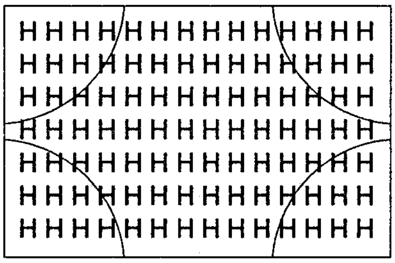
∗ Pay attention to the center of the screen.
(Around ○ in the figure below)





7. Loosen the screw of the green sub lens, and rotate the lens so that the H pattern on the screen becomes the clearest. Then, tighten the screw once again.

   * At this time, adjust the areas in the figure below so that the focus at the four corners are uniform.



8. Repeat 6. to 7. two to three times, and adjust so that the H pattern on the whole screen is clear.

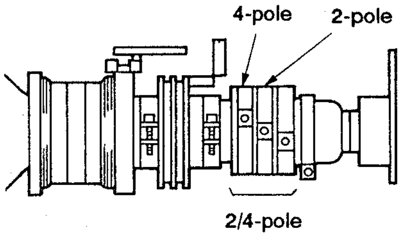
4-5. RED LENS FOCUS ADJUSTMENT

1. Press the CUT OFF G and B keys of the commander, and set to red (single color).
2. Adjust as in the green lens focus adjustment.

4-6. BLUE LENS FOCUS ADJUSTMENT

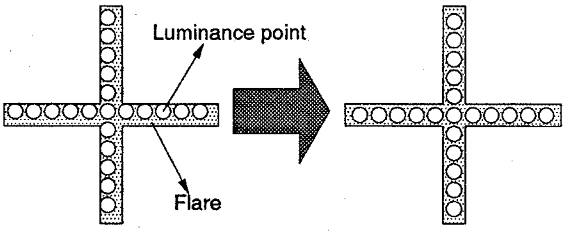
1. Press the CUT OFF R and G keys of the commander, and set to blue (single color).
2. Adjust as in the green lens focus adjustment.

4-7. GREEN 2/4-POLE ADJUSTMENT

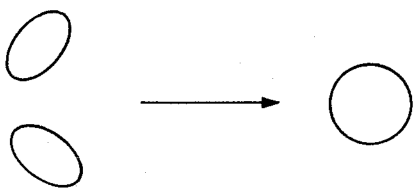


1. Use the commander to select an output not connected to a signal, and set it into a non signal condition. (To set f_H=34 kHz)
2. Press the TEST key for five seconds, and press the ▲ key to set the service man mode (Not required when already in service man mode).
   Press the RESET key, and set CONTR:MAX, BRT:50.
3. Press the CUT OFF R and B keys, and set to green (single color).
4. Press the TEST key, and output the cross hair pattern.
5. Rotate the green focus VR of the focus pack slightly to the left of the JUST point, and adjust so that there is flare on the cross hair pattern.
6. Adjust the 2-pole magnet so that the luminance point lies at the center of the flare.

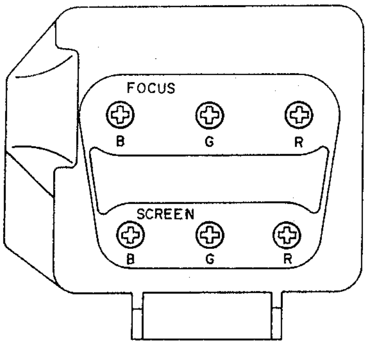
   * Adjust so that the luminance point lies at the center of the flare.



7. Press the TEST key and output the dot pattern.
8. Rotate the green focus VR of the focus pack slightly to the right of the JUST point, and over-focus the dot.
9. Adjust the 4-pole magnet so that the dot becomes round.



10. Repeat steps 4. to 9. and perform tracking as required.
11. Set the focus to JUST.



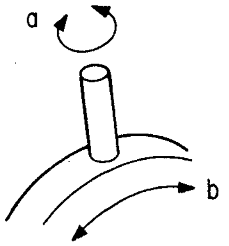
4-8. RED 2/4-POLE ADJUSTMENT

1. Press the CUT OFF [G] and [B] keys of the commander and set to red (single color).
2. Perform as in the green 2/4-pole adjustment.

4-9. BLUE 2/4-POLE ADJUSTMENT

1. Press the CUT OFF [R] and [G] keys of the commander and set to blue (single color).
2. Perform as in the green 2/4-pole adjustment.

Note: Method of adjusting the 2/4-pole



a ···· Modulates the power of the magnetic force
b ···· Modulates the direction of the magnetic force.

To adjust the 2-pole or 4-pole, rotate the knob in the direction shown a and then in the direction shown b, and adjust to optimum.

4-10. GREEN ELECTRIC FOCUS ADJUSTMENT

1. Use the commander to select an input not connected to a signal, and set it into a non signal condition.
   (To set f_H=34 kHz)
2. Press the [TEST] key continuously for five seconds, and press the [▲] key to set the service man mode.
   (Not required if already in the service man mode.)
3. Press the [RESET] key and set CONTR: 80, BRT: 50.
4. Press the CUT OFF [R] and [B] keys, and set to green (single color).
5. Rotate the GREEN volume of the focus pack, and adjust so that the H pattern is the clearest.

4-11. RED ELECTRIC FOCUS ADJUSTMENT

1. Press the CUT OFF [G] and [B] keys of the commander and set to red (single color).
2. Adjust as in the green electric focus adjustment.

4-12. BLUE ELECTRIC FOCUS ADJUSTMENT

1. Press the CUT OFF [R] and [G] keys of the commander , and set to blue (single color).
2. Adjust as in the green electric focus adjustment.

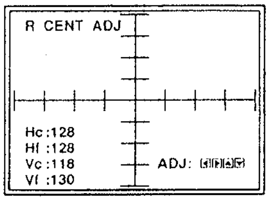
Note 1: The brightness in the blue electric focus adjustment changes according to its focus point. The brightest spot is at the JUST point.

Note 2: When the blue electric focus adjustment has been performed, the brightness of blue will change and the W/B may shift. Do not adjust unless the CRT has been replaced.

4-13. REGISTRATION ADJUSTMENT

Centering Adjustment

1. Press ZONE to display cross-hairs.
2. Press ADJ R when the red CRT is replaced.
3. Use the arrow keys ◀ ▶ ▲ ▼ and align the red center line with the green center line.



Note 1: Zone control mode ① adjust centering.
CENT R and B provide small variation width for users.
CENT R and B become the G centering adjust mode when pressed simultaneously. The variation width is also small.

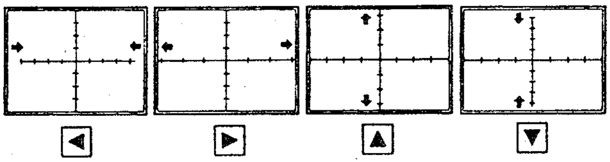
Note 2: When the computer display is shifted, press RGB SHIFT and adjust with arrow keys ◀ ▶ ▲ ▼. Then, press MEMORY. The test signal position dose not shift after pressing TEST.

Note 3: Follow the instructions below when the VIDEO display position is shifted:

① Press ZONE.
② Press ADJ G.
③ Press TEST for minimum 5 seconds to display VIDEO.
Press CUT OFF R and B for G mono color. Adjust with arrow keys ◀ ▶ ▲ ▼.
④ Press ZONE again.
Press ADJ R.
Match G and R.
⑤ Press ADJ B to match R and B.
⑥ Press NORMAL to match R and B.
⑦ Press TEST.
Test signal position is shifted.

Size Adjustment

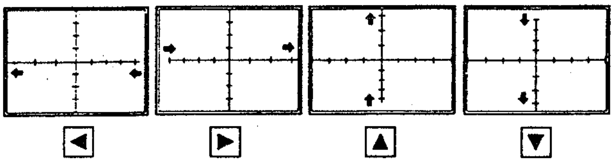
1. Press SIZE for size adjustment mode.
2. Adjust display size against the screen with arrow keys.
3. Match four display dimensions.



4. Follow the instructions below when the computer display size is too small or too large. Press RGB SIZE and adjust with arrow keys ◀ ▶ ▲ ▼.
Press MEMORY key.
Test signal size is same when pressing TEST.

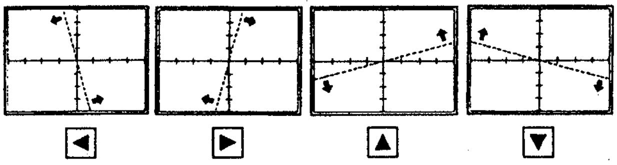
Linearity Adjustment

1. Press LIN and set at linearity adjustment mode.
2. Use arrow keys to adjust vertical and horizontal balance.
3. Adjust in four direction.



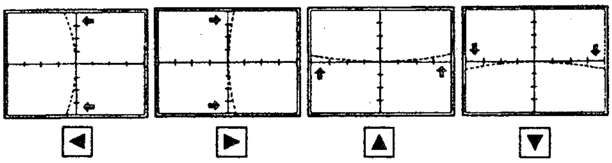
Skew Adjustment

1. Press SKEW and set at skew adjustment mode.
2. Use arrow keys to adjust each center line vertically and horizontally.



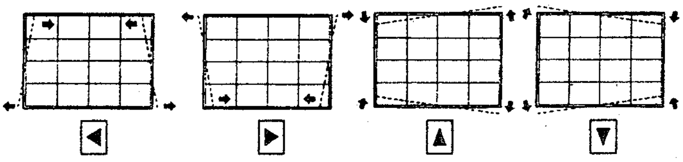
Bow Adjustment

1. Press BOW and set at bow adjustment mode.
2. Use arrow keys to straighten bowing line.



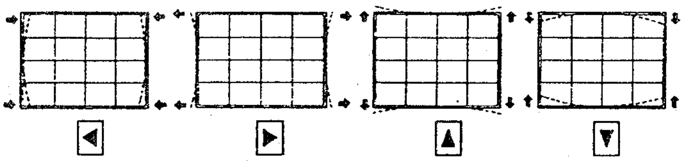
Keystone Adjustment

1. Press KEY and set at keystone adjustment mode.
2. Use arrow keys to adjust trapezoid shape distortions vertically and horizontally.



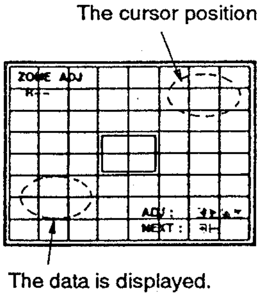
Pincushion Adjustment

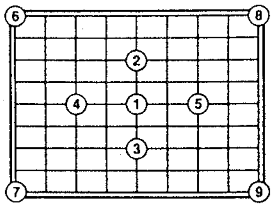
1. Press PIN and set at pin adjustment mode.
2. Use arrow keys to adjust spool shape distortion vertically and horizontally.



Zone Adjustment

1. Press ZONE and set at zone adjustment mode.
2. Press POSITION + and − keys to select part to be adjusted.
3. Use arrow keys ◀ ▶ ▲ ▼ to adjust line distortion near cursor.





NOTE: Refer to the installation manual for details of the registration adjustment.

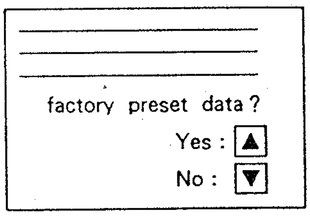
4-14. WHITE BALANCE ADJUSTMENT

<Preparations>

① Press TEST for more than 5 sec.
② Screen display will change to service man mode display.
③ Press arrow key ▲.

1. G2 (Screen) VR Adjustment

① Use the commander to select an input not connected to a signal and set it into a non signal condition.
(Set f_H:34 kHz)
② Press the TEST key continuously for five seconds, and press the ▲ key to set the service man mode.
(Not required if already in the service man mode.)
③ Press the PAGE key and set the color temperature to 6500 °K.
④ Press the BIAS key and set the bias adjustment mode.
⑤ Press the arrow ◀ and ▶ keys simultaneously and check that the following messages are displayed.
⑥ Press the arrow ▲ key. (This will input the factory preset data in the memory.)



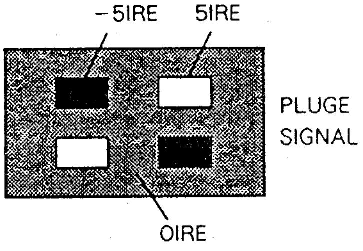
factory preset data ?
Yes : ▲
No : ▼

7. When performing adjustments using the digital voltmeter, adjust as follows.
   1) Adjust the BLUE G_2 VR so that the voltage between Pins ① and ② of connector CFB-5 becomes 4 ± 0.2VDC.
   2) Adjust the GREEN G_2 VR so that the voltage between Pins ① and ③ of connector CFB-5 becomes 4 ± 0.2VDC.
   3) Adjust the RED G_2 VR so that the voltage between Pins ① and ④ of connector CFB-5 becomes 4 ± 0.2VDC.

8. When performing adjustments without using the digital voltmeter, adjust as follows.
   1) Short circuit 1. and 2. of the CFB-3 connector (2P) of the CFB board.

Note: The 2P connector to be short-circuited is inserted in connector L302 of the L board. After the adjustment, insert it back into the L board.

   2) View the tube surface of each CRT directly from the lens, and adjust the brightness of the R, G, B single colors to the following, by rotating G2VR.



Note: Adjust with the tube display turned on.
The background (0IRE) becomes as bright as -5IRE. Adjust to the point where +5IRE is slightly shining.

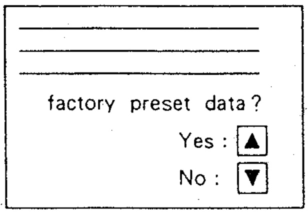
   3) Release the short-circuit in ⑥.

2. 9,300 °K Adjustment

① Input video signal. (100IRE white)
② Press PAGE and set color temperature at 9,300°K.
③ Press BIAS or GAIN and set at bias adjustment mode.
④ Press arrow keys ◀ and ▶ simultaneously, and confirm the following message is displayed.
⑤ Press arrow key ▲. (This will input factory preset data in memory)
⑥ Press BIAS.
⑦ Press TEST until screen is white signal.
⑧ Set CONT: Minimum, BRT: Minimum.
⑨ Use color analyzer and adjust blue and red so that;
x: 0.284 ± 0.015
y: 0.297 ± 0.025.
Do not adjust green bias.
⑩ Press MEMORY.
⑪ Press GAIN.
⑫ Press TEST until screen displays external signal.
⑬ Press RESET and set CONT: 80%, BRT: 50%.
⑭ Use color analyzer and set green and red so that;
x: 0.284 ± 0.015
y: 0.297 ± 0.025.
Do not adjust blue gain.
⑮ Press MEMORY.

3. 6,500 °K Adjustment

① Input video signal.
② Press PAGE and set color temperature at 6,500°K.
③ Press BIAS or GAIN and set at bias adjustment mode.
④ Press arrow keys ◀, ▶ simultaneously and confirm the following message is displayed.

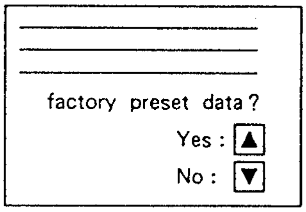


factory preset data?
Yes : ▲
No : ▼

⑤ Press arrow ▲ key. (This will input factory preset data in memory)
⑥ Press BIAS.
⑦ Press TEST until screen is blank.
⑧ Set CONT: Minimum, BRT: Minimum
⑨ Use color analyzer and adjust blue and red so that;
x: 0.313 ± 0.015
y: 0.329 ± 0.015
Do not adjust green bias.
⑩ Press MEMORY.
⑪ Press GAIN.
⑫ Press TEST until screen displays external signal.
⑬ Press RESET and set CONT: 80%, BRT: 50%.
⑭ Use color analyzer and adjust green and red so that;
x: 0.313 ± 0.015
y: 0.329 ± 0.015
Do not adjust blue gain.
⑮ Press MEMORY.

4. 3,200 °K Adjustment

① Input video signal.
② Press PAGE and set color temperature at 3,200°K.
③ Press BIAS or GAIN and set at bias adjustment mode.
④ Press arrow keys ◀, ▶ simultaneously and confirm the following messages are displayed.



factory preset data?
Yes : ▲
No : ▼

⑤ Press arrow key ▲. (This will input factory preset data in memory)
⑥ Press BIAS.
⑦ Press TEST until screen is blank.
⑧ Set CONT: Minimum, BRT: Minimum.
⑨ Use color analyzer and adjust blue and red so that;
x: 0.423 ± 0.015
y: 0.399 ± 0.015
Do not adjust green gain.
⑩ Press MEMORY.
⑪ Press GAIN.
⑫ Press TEST until screen displays external signal.
⑬ Press RESET and set CONT: 80%, BRT: 50%.
⑭ Use color analyzer and adjust red and blue so that;
x: 0.428 ± 0.015
y: 0.399 ± 0.015
Do not adjust green gain.
⑮ Press MEMORY.

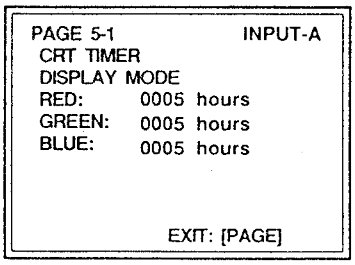
5. Preset Adjustment

① Press PAGE and preset color degree.
② Press GAIN and set R, G, B gain data at 6,500°K data.
③ Press BIAS and set R, G, B bias data at 6,500°K data.
④ Press MEMORY.
⑤ Press PAGE and after setting color temperature at 6,500 °K, press MEMORY.

6. CRT Timer Reset

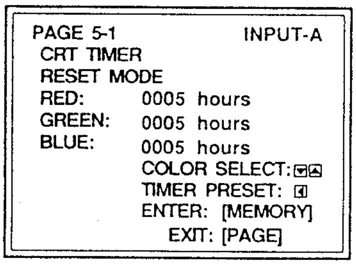
If you replace the cathode-ray tubes, reset the timer to "0000".

① Press the [PAGE] key five times to display PAGE 5.
② Select "1. CRT TIMER DISPLAY" with the [▶] key.
The PAGE 5-1 tells how long the cathode-ray tubes were used.



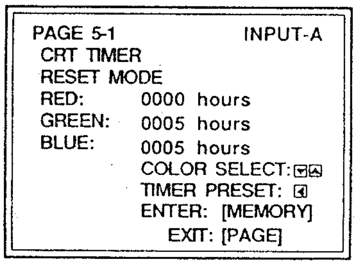
```
PAGE 5-1            INPUT-A
 CRT TIMER
 DISPLAY MODE
 RED:      0005  hours
 GREEN:    0005  hours
 BLUE:     0005  hours


               EXIT: [PAGE]
```

③ Press the [◀] and [▶] keys simultaneously to enter the CRT timer reset mode.



```
PAGE 5-1            INPUT-A
 CRT TIMER
 RESET MODE
 RED:      0005  hours
 GREEN:    0005  hours
 BLUE:     0005  hours
           COLOR SELECT:▼▲
           TIMER PRESET: ◀
           ENTER:  [MEMORY]
              EXIT: [PAGE]
```

④ Select the color to reset with the [▲] and [▼] keys.
The selected color blinks.
⑤ Press the [◀] key.
The blinking timer is reset to "0000".



```
PAGE 5-1            INPUT-A
 CRT TIMER
 RESET MODE
 RED:      0000  hours
 GREEN:    0005  hours
 BLUE:     0005  hours
           COLOR SELECT:▼▲
           TIMER PRESET: ◀
           ENTER:  [MEMORY]
              EXIT: [PAGE]
```

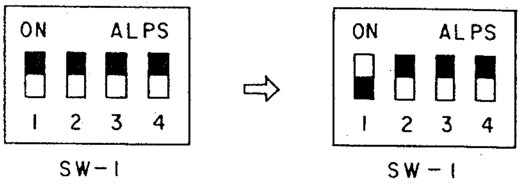
⑥ Repeat steps ④ and ⑤ for other colors.
⑦ Press the [MEMORY] key.

4-15. Y BOARD, IC4 (EEPROM) REPLACEMENT

4-15-1. Initialization

IC4 (EEPROM) on Y board requires initialization at it replacement. Perform the initialization using following procedures.

1. Turn MAIN POWER SW of the projector off.
2. Remove cabinet, ED bracket and the cover of Y shield case to make possible to access to Y board.
3. Remove Y board from the projector. Replace the EEPROM. Set ① of SW-1 only to its lower position, then restore it to original position.



4. Disconnect connectors DC-10/DC-11/DC-12 on DC board.
5. Turn MAIN POWER SW of the projector on, then using the commander, POWER ON the projector.
6. Press SW-2 on Y board (flushing of red LED on Y board stops).
7. Press SW-2 on Y board again (red LED on Y board turns on, then turns off after 30 seconds to 1 minute).
8. Using the commander, POWER OFF the projector, then turn MAIN POWER SW off.
9. Connect again connectors DC-10/DC-11/DC-12 on DC board.
10. After STAND BY lamp completely turned off, turn MAIN POWER SW on while holding down SW-2 on Y board (Press and hold down SW-2 for more than 5 seconds after turning MAIN POWER SW on. Red LED on Y board still turns on).

This ends EEPROM initialization.

4-15-2. Generation of Factory Data

No factory data exists in the EEPROM just initialized.
Generate the factory data by performing following adjustment items.

(a) RGB registration data of 8 blocks between 15 kHz to 75 kHz (including VIDEO size/blanking data).
(b) GAIN/BIAS data at preset color temperature of 9300°, 6500° and 3200°.
(c) SHIFT (left/right direction only) data of VIDEO signal
(d) SHIFT (left/right direction only) data of cross-hatch with no input signal

(a) Generation of RGB registration data of 8 blocks between 15 kHz to 75 kHz:

1. Install the projector on floor with a 120" screen combined.

CAUTION:
Ensure that the projector and the screen are in correct optical location.

2. Input a signal with f_H = 34kHz to the projector. Perform adjustment of registration at registration-block 4.
   CAUTION:
   Do not perform this adjustment without input signal (if perform the adjustment without input signal, perform it after adjustment in step (d) SHIFT data of cross-hatch with no input signal has been completed).
   NOTE:
   Register block 4 : f_H = 30 to 37 kHz.
3. Then, perform adjustment of blanking on register block 4.
4. Press and hold down MEMORY key to perform STANDARD SAVE.
5. Change f_H of the signal, then perform adjustment of registration and blanking on remaining register blocks 1 to 3 and 5 to 8.

NOTE:

register block No.	f_H
1	15 kHz to 19 kHz
2	19 kHz to 24 kHz
3	24 kHz to 30 kHz
4	30 kHz to 37 kHz
5	37 kHz to 45 kHz
6	45 kHz to 55 kHz
7	55 kHz to 66 kHz
8	66 kHz to 85 kHz

For method of installation, adjustment of registration/blanking, refer to the installation manual.

(b) Generation of W/B data

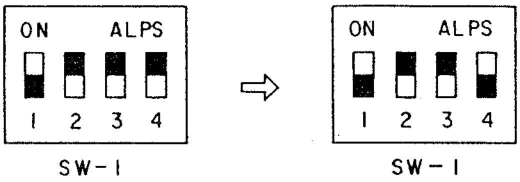
1. Perform adjustment on GAIN/BIAS at color temperature of 9300°, 6500° and 3200°.
   For the method of color temperature adjustment, refer to "W/B adjustment" on page 205 of this manual.

(c) Adjustment of SHIFT (left/right direction only) data of VIDEO signal.

1. Connect a VIDEO signal, and select the input.
2. Press TEST key to display cross hatch pattern. Check that cross hatch pattern is projected at the center of screen. If not, adjust RGB registration data again.
3. Press BLKG key on the commander, and adjust to display all video at the left and the right sides (Set messages LF: to MIN, and RI: to MAX respectively. These messages are at the lower-left corner of screen).
4. Press SHIFT key, and adjust the VIDEO to its best position (no up-down adjustment is possible).
5. Press BLKG key, and adjust VIDEO to its best condition at the left and the right sides of screen. Press MEMORY key.

(d) Adjustment of SHIFT (left/right direction only) data of cross-hatch with no input signal

1. Using the commander, turn POWER to the projector off. Remove Y board. Set ④ of SW-1 to its lower position, then restore it to original position.

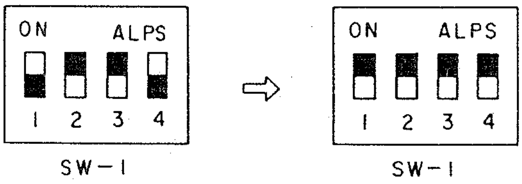


2. Using the commander, turn POWER to the projector on. Select the input to which a signal is connected.
   (**NOTE:** Recommend to use a signal of f_H = 34 kHz, or so).
3. Press TEST key, and mark the center location of cross-hatch on the screen.
4. Select an input to which no signal is connected. Press SHIFT key followed by TEST key.
5. Using arrow keys (◀, ▶), align vertical line of cross-hatch to the position marked in step 3, then press MEMORY key.
   (Pressing arrow keys ▲ or ▼ changes data in the message V: at the lower-left corner of screen, but does not move the location of cross-hatch. Set this data to 128).

4-15-3. Saving the Factory Data

Save the factory data just adjusted into the EEPROM.

1. While POWER to the projector is on, set ④ and ① of SW-1 to ON position, ④ first, then ①. (red LED turns on at the same time when setting ① of SW-1 to ON position, and turns off after a few seconds).



CAUTION:
Pressing SW-1 before you set ① of SW-1 on Y board to ON position causes all the data to be set to center value (128).

2. Using the commander, turn POWER to the projector off. After more than 5 seconds, POWER ON again. This saves the factory data to the EEPROM.
3. Finally, adjust the blanking of Video signal again and save data into memory.

SECTION 5
SAFETY RELATED ADJUSTMENT

When exchanging ◪ part check HV hold-down circuit, HV regulation circuit, LOW B protector circuit and beam current protector circuit.

☒ R33, R34 [HV hold-down] PA board
◪ IC2, Q7, D9, D12, C13, R20, R21, R22, R23, R24, R32, R33, R34, R35, R36, R82, HV BLOCK, PA mount

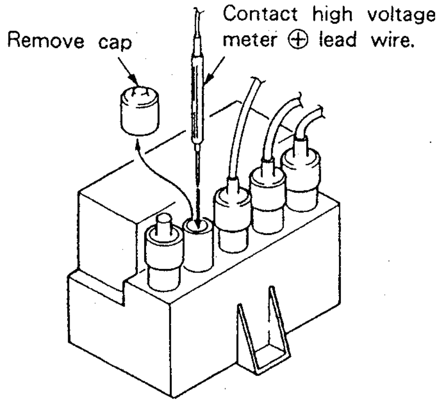
☒ R41, R42 [HV regulation] PA board
◪ IC1, IC6, IC7, IC8, IC9, D13, C16, R37, R38, R39, R40, R41, R42, R53, R55, R56, R58, R59, R129, X1, HV BLOCK, PA mount, PB mount

☒ R29, R30 [LOW B protector] PA board
◪ IC1, IC3, IC5, Q8, D4, D5, D10, D11, R9, R10, R26, R28, R29, R30, R31, R88, R95, PA mount
R733 (DA board)

☒ R1, R4 [Beam current protector] PA board
◪ IC2, IC3, IC5, Q1, Q2, Q7, Q8, D4, D5, D9, R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R20, R21, R22, R23, R24, R43, R44, R45, R46, R47, R82, R88, R119, R120, R121, R122, R733 (DA board), PA mount, PB mount

☒ R33, R34 : HV Hold-down

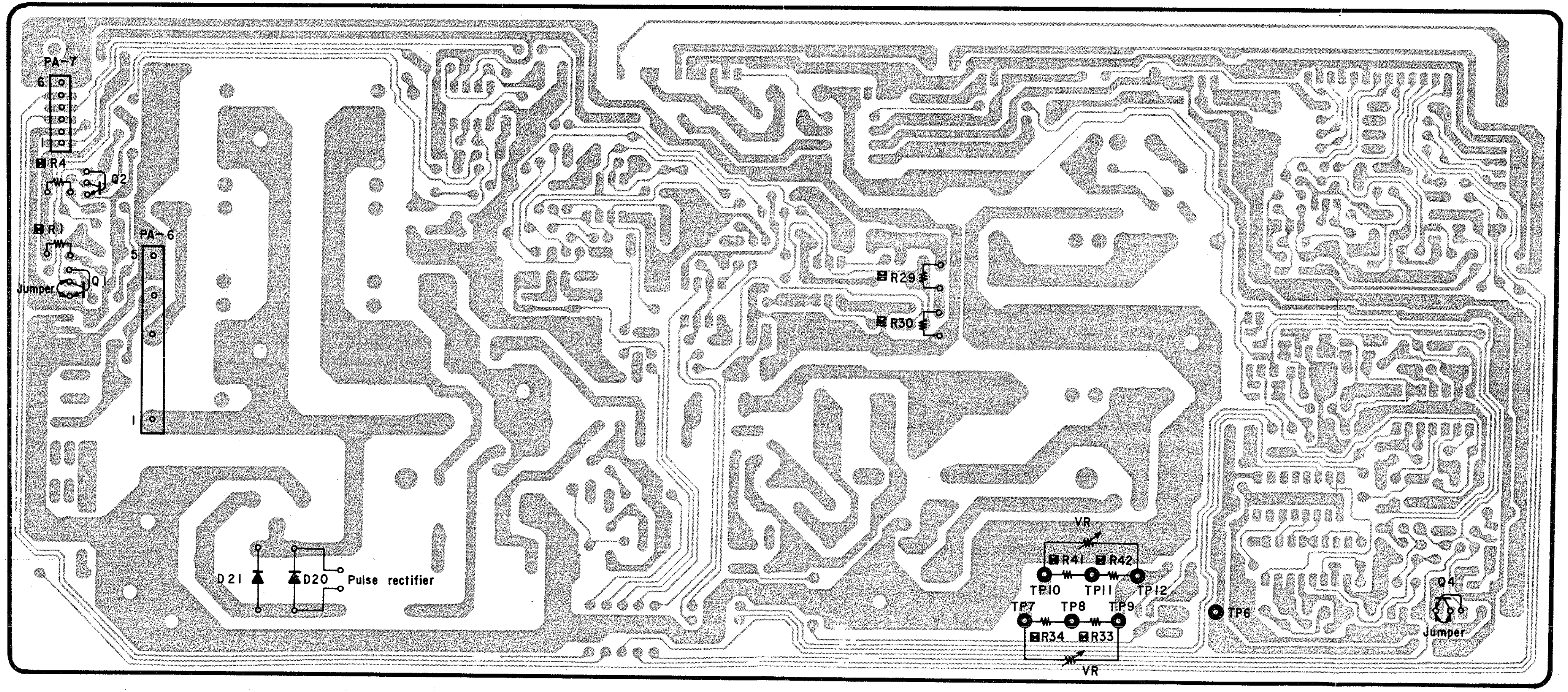
1. Confirm set power is turned OFF.
2. Connect high voltage meter ⊕ to HV filter vacant terminal and ⊖ to chassis earth.
3. Remove resistance mounted between PA board TP7 – TP9 . Connect variable resistor and set at 47K Ω.
4. Remove resistance mounted between PA board TP10 – TP12. Connect variable resistor and set at 27K Ω.
5. Turn RV1 fully countercloskwise.
6. Turn set power ON.
7. Input monoscope signal, and set CONTR and BRT at maximum.
8. Turn variable resistor between TP10 – TP12 to change resistance value and adjust high voltage to around 34.0±0.3KV.
9. Turn variable resistor between TP7 – TP9 to change resistance value, adjust high voltage to around 34.0±0.3KV, and confirm hold-down circuit operates and raster disappears.
10. Turn set power OFF.
11. Remove variable resistor between TP7 – TP9. Measure the volume resistance value and solder on the same amount of resistance to R33, R34 (carbon, 1/4W).
12. Next, slightly raise volume resistance value between TP10 – TP12.
13. Turn set power ON.
14. Turn variable resistor between TP10 – TP12 again and raise high voltage. Confirm hold-down circuit operates at 34.0±0.3KV and raster disappears.
15. Next, adjust HV regulation.



☒ R41, R42 : HV regulation

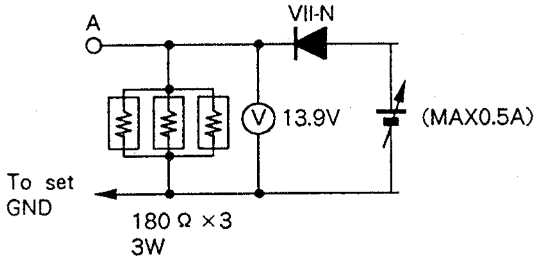
1. Confirm set power is OFF.
2. Connect high voltage meter ⊕ to HV filter vacant terminal and ⊖ to chassis earth.
3. Set variable resistor between PA board TP10 – TP12 to 27K Ω.
4. Turn set power ON.
5. Press CUT-OFF key and cut-off R, G, B.
6. Turn variable resistor between TP10 – TP12 to change resistance value and adjust high voltage to around 33.0±0.3KV.
7. Turn set power OFF.
8. Remove variable resistor between TP10 – TP12. Measure the volume resistance value and solder on the same amount of resistance to R41, R42 (carbon, 1/4W).
9. Turn set power OFF.
10. Confirm high voltage meter reads 33.0±0.3KV.
11. Turn set power OFF and remove high voltage meter.

PA BOARD



⧓ R29, R30 : LOW B Protector

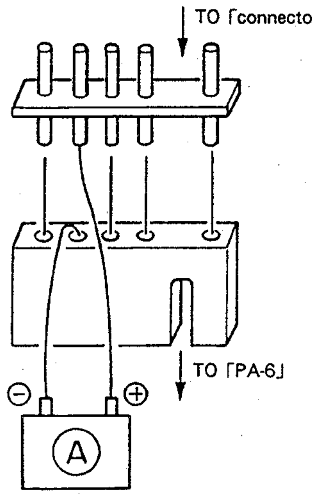
- Prepare jig circuit as shown in figure.
- Adjust until high voltage meter shows 13.9V.



1. Turn set power ON.
2. Contact jig circuit A point to PA board TP6 (12V line) for 0.5−1 sec. and remove immediately. Confirm power turns OFF when doing so.
3. If power does not turn OFF, adjust R29, R39.

⧓ R1, R4 : Beam Current Protector

1. Confirm set power is turned OFF.
2. Disconnect PA board connector PA−6 and connect jig shown in figure.
3. Short circuit PA board Q1 emitter and collector.
4. Turn set power ON.
5. Input monoscope signal, send beam current by CONTR, BRT and G2VR, and confirm protector circuit operates at under 4700 μA and raster is erased.
6. If protector circuit does not operate, adjust R4.
7. Remove jig short−circuiting Q1 emitter and collector.
8. Next, short−circuit Q4 emitter and collector.
9. Turn set power ON.
10. Send beam current by CONTR, BRT and G2VR, and confirm protector operates at under 4700 μA and raster is erased.
11. When protector does not operate, adjust R1.
12. Remove jig short−circuiting Q4 emitter and collector.



To Check without Using High Voltage Meter

⧓ R33, R34 : HV Hold−down

1. Use voltage dividing network shown in figure to calibrate detection unit.

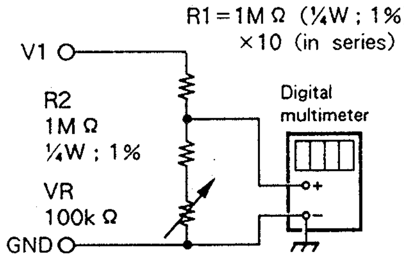
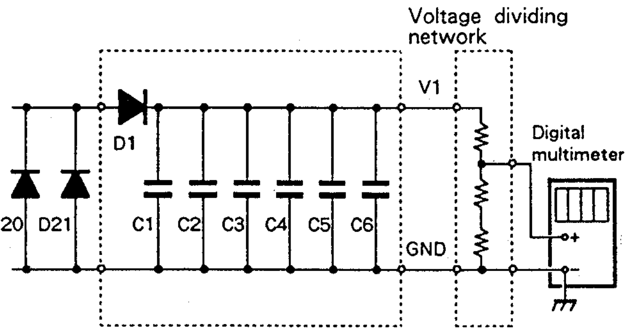


Fig. 1 : Voltage dividing network

2. Remove PA board connector (PA−7) to hold down high voltage. Connect V1 to 100V line of set and read V1 voltage with digital multimeter. Next, adjust volume (VR) so that digital multimeter value is 1/10 of V1.
3. Connect pulse rectifier between PA board D20 or D21 anode and cathode.



Pulse rectifier D1: VIN-N
C1~C6: 20000P/1.6KV

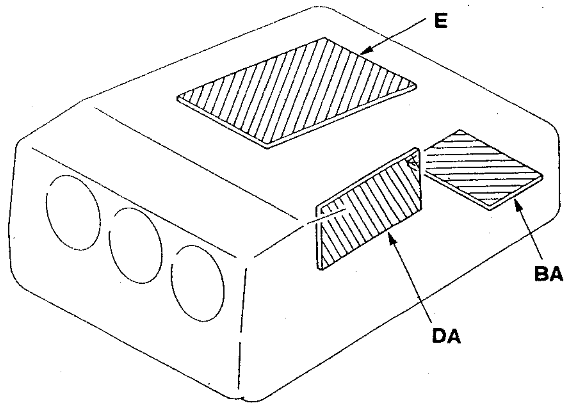
4. Confirm set power is turned OFF.
5. Confirm pulse rectifier and voltage dividing network are connected.
6. Remove resistance mounted between PA board TP7 − TP9, connect volume and set at 47K Ω.
7. Remove resistance mounted between TP10 − TP12, connect volume and set at 27K Ω.
8. Turn RV1 fully counter clockwise.
   Connect PA board connector (PA-7).
9. Turn set power ON.
10. Input monoscope signal, and set CONTR and BRT at maximum.
11. Turn variable resistor between TP10 − TP12 and adjust until digital multimeter value is 96.5±0.5VDC.
12. Turn variable resistor between TP7 − TP9, and confirm hold−down circuit operates and luster is erased when digital multimeter is 96.5±0.5VDC.
13. Turn set power OFF.
14. Remove volume between TP9−TP11. Measure the volume resistance value and solder on the same resistance volume to R33, R34 (carbon, 1/4W).
15. Slightly raise volume resistance between TP10 − TP12.
16. Turn set power ON.
17. Turn volume between TP10 − TP12 and confirm hold−down circuit operates and raster is erased when digital multimeter value is 96.5±0.5VDC.
18. Next, adjust HV regulation.

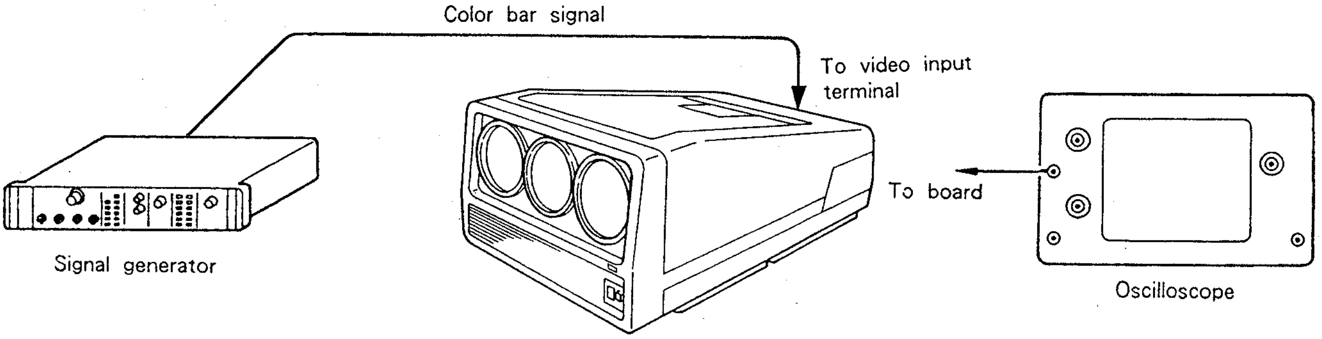
⧓ R41, R42 : HV Regulation

1. Confirm set power is OFF.
2. Set variable resistor between PA board TP10 − TP12 at 27K Ω.
3. Turn set power ON.
4. Press CUT−OFF key to cut−off R, G, B.
5. Turn variable resistor between TP10 − TP12 and change resistance value. Confirm digital multimeter value is 83.5±0.5VDC.
6. Turn set power OFF.
7. Remove TP10 − TP12 variable resistor. Measure the volume resistance value and solder on the same resistance volume to R41, R42 (carbon, 1/4W).
8. Turn set power ON.
9. Confirm digital multimeter value is 83.5±0.5VDC.
10. Turn set power OFF and remove pulse rectifier.

SECTION 6
CIRCUIT ADJUSTMENTS

Note :
Fit DY (deflection yoke) tightly to picture tube when conducting basic adjustment, electric adjustment or exchanging picture tube.

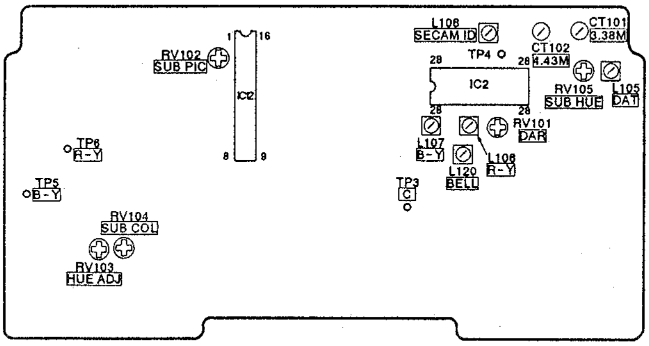



Color bar signal
To video input terminal
To board
Signal generator
Oscilloscope

6-1. BA BOARD ADJUSTMENT

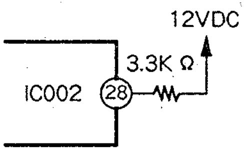
(Add X board, Complete ((A-1499-937-A) to extend)

(Component side)

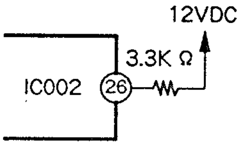

L108
SECAM ID
CT101
3.38M
CT102
4.43M
TP4
IC2
RV105
SUB HUE
L105
DAT
RV101
DAR
L107
B-Y
L106
R-Y
L120
BELL
TP3
C
RV102
SUB PIC
TP6
R-Y
TP5
B-Y
RV104
SUB COL
RV103
HUE ADJ

REF. OSC Adjustment (CT101, CT102)

1. Input PAL color bar.
2. Adjust CT102 so that the display becomes colored.
3. Connect 3.3K Ω to IC002 pin ㉘, apply 12VDC and set at PAL forced MODE.


12VDC
3.3K Ω
IC002
28

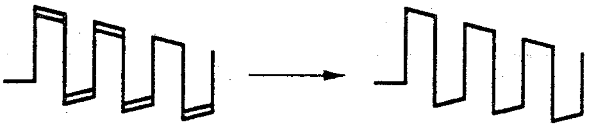
3. Ground IC002 pin ⑰ and turn color-killer OFF.
4. Adjust CT102 until screen movement slows.
5. Disconnect IC002 pin ⑰ grounding.
6. Input NTSC3.58 color bar.
7. Adjust CT101 so that the display becomes colored.
8. Connect 3.3K Ω to IC002 pin ㉖, apply 12VDC and set at NTSC3.58 forced MODE.


12VDC
3.3K Ω
IC002
26

8. Ground IC002 pin ⑰ and turn color-killer OFF.
9. Adjust CT101 until screen movement slows.
10. Disconnect 3.3K Ω connected to IC.
11. Disconnect IC002 pin ⑰ grounding.

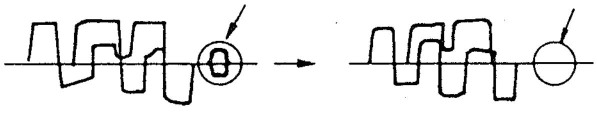
1H DELAY LINE Adjustment

1. Input PAL color bar.
2. Connect oscilloscope to TP-5 and view wave form in H block.


(Before adjustment) (After adjustment)

3. Connect 3.3K Ω to IC002 pin ㉘, apply 12VDC and set at PAL forced MODE.

4. Adjust L105 and minimize double line part of wave.
5. Input PAL special color bar.
6. Adjust RV101 until wave ANTI PAL part is at 0 – level.



(Before adjustment) (After adjustment)

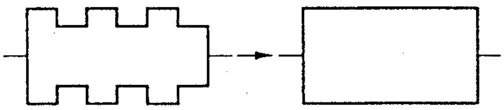
- RV101 and L103 influence each other. Repeat adjustment until both conditions are satisfied.

SECAM ID Adjustment (L108)

1. Input SECAM color bar.
2. Connect 3.3K Ω to IC002 pin㉘, apply 12VDC and set at PAL forced MODE.
3. Connect digital multimeter to TP4.(input impedance over 50M Ω)
4. Adjust L108 level to maximum.

BELL Filter Adjustment (L120)

1. Input SECAM color bar.
2. Connect 3.3K Ω to IC002 pin㉘, apply 12VDC and set at PAL forced MODE.
3. Connect oscilloscope to TP3 and view wave form of H block.
4. Adjust L120 until wave is flat.



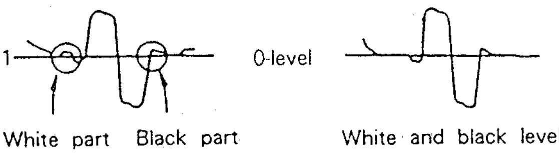
(Before adjustment) (After adjustment)

※ Track L120 and L108

SECAM DISCRI Adjustment (L106, L107)

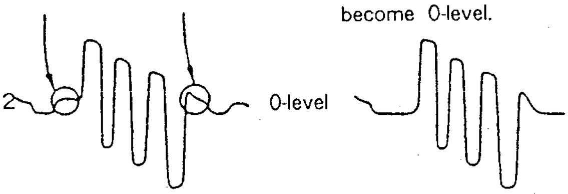
1. Input SECAM color bar.
2. Connect 3.3K Ω to IC002 pin㉘, apply 12VDC and set at PAL forced MODE.
3. Connect oscilloscope to TP6 and view wave form of H block.

Fig. 1



White and black levels become 0-level.

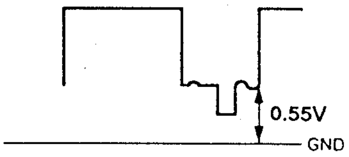
Fig. 2



4. Adjust L106 until white and black part of TP6 wave become 0 – level. (Fig. 1)
5. Connect oscilloscope to TP5 and view wave form of H block.
6. Adjust L107 until white and black part of TP5 wave become 0 – level. (Fig. 2).

SUB BRIGHT Confirment

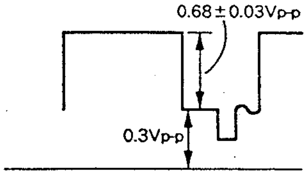
1. Input blank signal (100IRE).
2. Connect oscilloscope to BB board TP5 and view wave form of H block.



3. Confirm pedestal level is 0.55 ± 0.02V.

SUB PICTURE Adjustment (RV102)

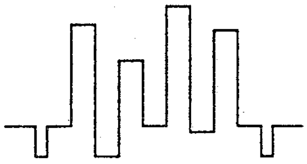
1. Input blank signal (100IRE).
2. Connect oscilloscope to BB board TP5 and view wave form of H block.



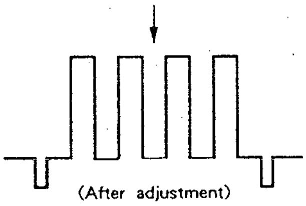
3. Adjust RV102 until pedestal to peak is 0.68±0.03Vp-p.

HUE, SUB COLOR, SUB HUE Adjustment (RV103, RV104, RV105)

1. Input PAL color bar signal.
2. Connect oscilloscope to TP10 and view wave form of H block.
3. Adjust RV103 (HUE) and RV104 (SUB COL) until wave is flat.



(Before adjustment)

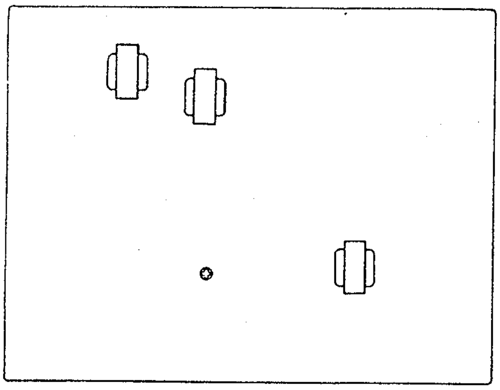


(After adjustment)

4. Input NTSC3.58 color bar.
5. Adjust RV105 (SUB HUE) until wave is flat.

6-2. E BOARD ADJUSTMENT

(Component side)



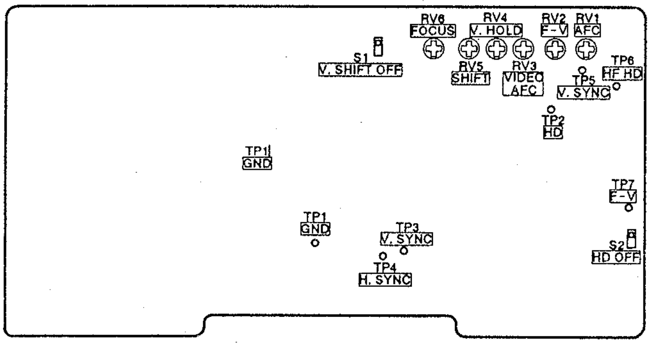
H.SIZE Adjustment (RV104)

1. Input monoscope signal.
2. Press remote commander [SIZE] key, and then arrow key ▶ to set H. SIZE at maximum.
3. Turn RV104 and adjust to frame 15.

6-3. DA BOARD ADJUSTMENT

(Add X board, Complete ((A-1499-937-A) to extend)

(Component side)



AFC Adjustment (RV1)

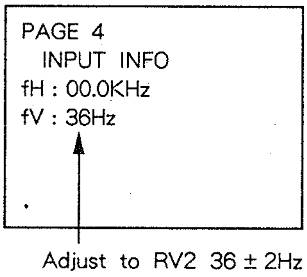
1. Input approximately 30KHz R, G, B signal.
2. Turn RV1 full clockwise.
3. Press S2 (HD OFF) switch and set at image free running state.
4. Turn RV1 counter clockwise a little at a time and stop image.
5. Connect TP2 to frequency counter.
6. Read frequency counter indicated value while pressing S1 switch.
   The value is f1.
7. Turn RV1 full counter clockwise.
8. Press S2 switch and set at image free running state.
9. Turn RV1 to clockwise a little at a time and stop image.
10. Read frequency counter indicated value while pressing S2 switch.
    The value is f2.
11. Adjust $\frac{f1+f2}{2}$ ±200Hz value with RV1.

Video AFC Adjustment (RV3)

1. Input video signal.(fH = 15.75KHz, FV = 60Hz)
2. Turn RV3 (video AFC) full clockwise.
3. Press S2 (HD OFF) switch and set at image free running state.
4. Turn RV3 to left a little af a time and stop image.
5. Connect frequency counter to TP2.
6. Read frequency counter indicated value while pressing S2 switch.
   The value is f1.
7. Turn RV3 full counter clockwise.
8. Press S2 and set at image free running state.
9. Turn RV3 right a little at a time and stop image.
10. Read frequency counter indicated value while pressing S2.
    The value is f12.
11. Adjust to $\frac{f1+f2}{2}$ ±200Hz with RV3.

V HOLD Adjustment (RV4)

1. Set at No-signal state.
2. Press remote commander PAGE key and display PAGE4.
3. Press S1 (V SYNC OFF).
4. Adjust until screen display fV is 36 ± 2Hz with RV4 (V HOLD).



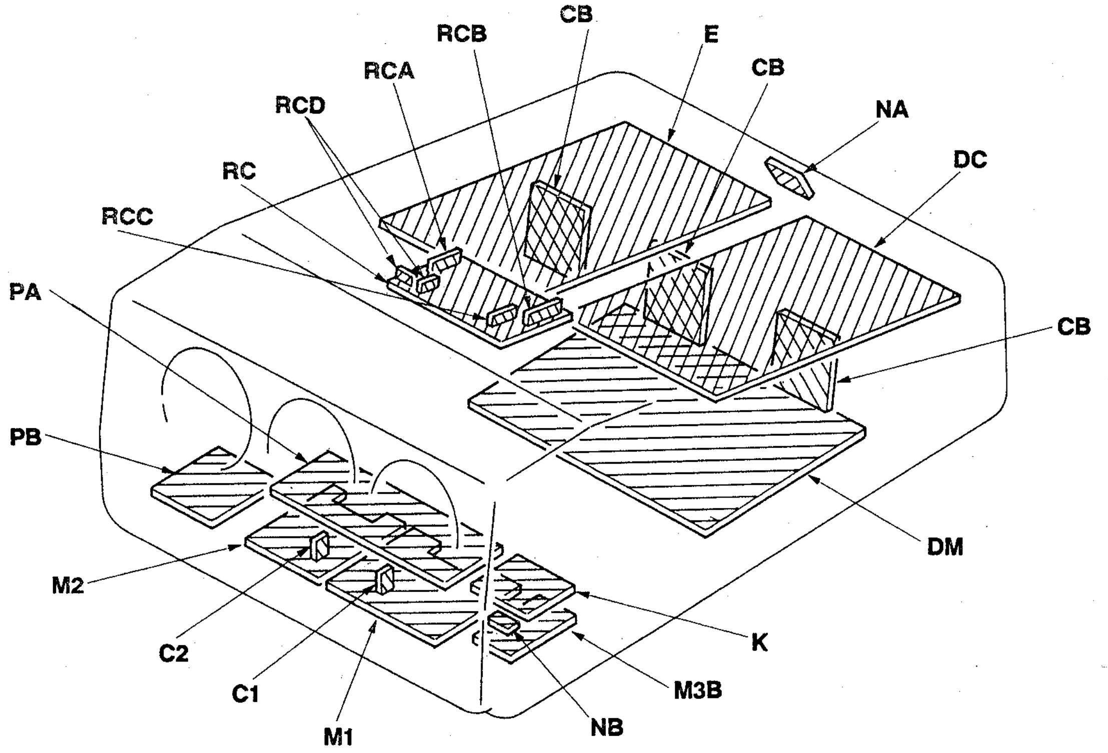
PAGE 4
INPUT INFO
fH : 00.0KHz
fV : 36Hz

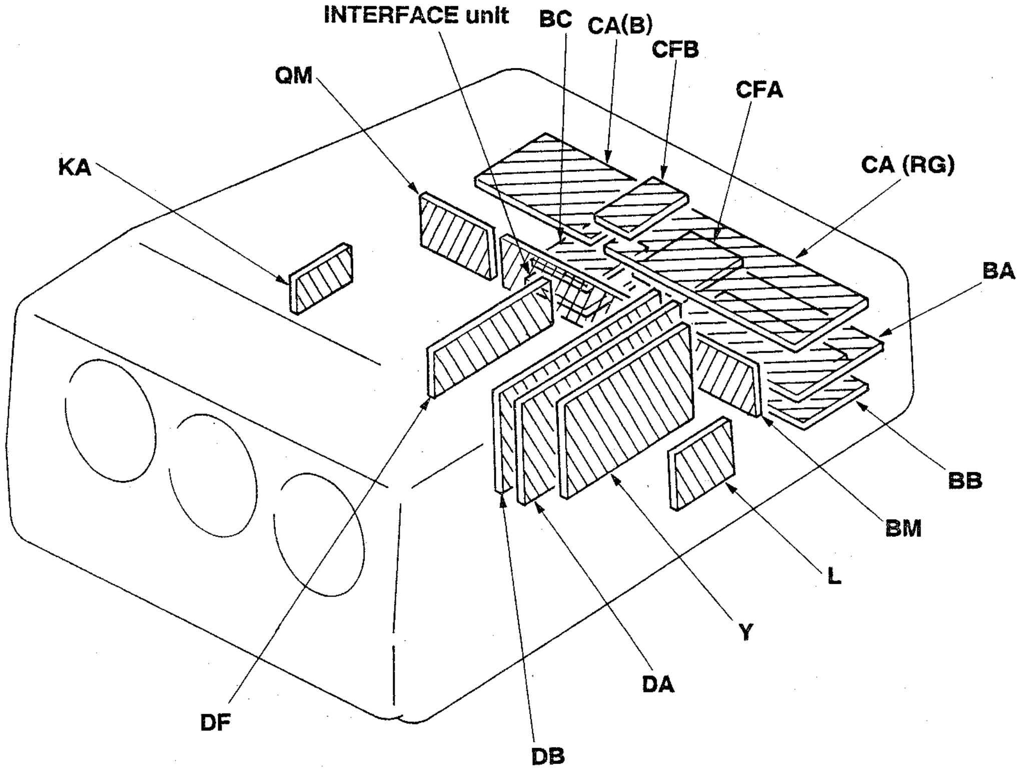
Adjust to RV2 36 ± 2Hz

MEMO

SECTION 7
DIAGRAMS

7-1. CIRCUIT BOARDS LOCATION


CB
RCB
E
RCA
CB
RCD
NA
RC
DC
RCC
PA
CB
PB
DM
M2
K
C2
M3B
C1
NB
M1


INTERFACE unit
BC
CA(B)
CFB
QM
CFA
KA
CA (RG)
BA
BB
BM
L
Y
DA
DF
DB

7-2. QUICK REFERENCE

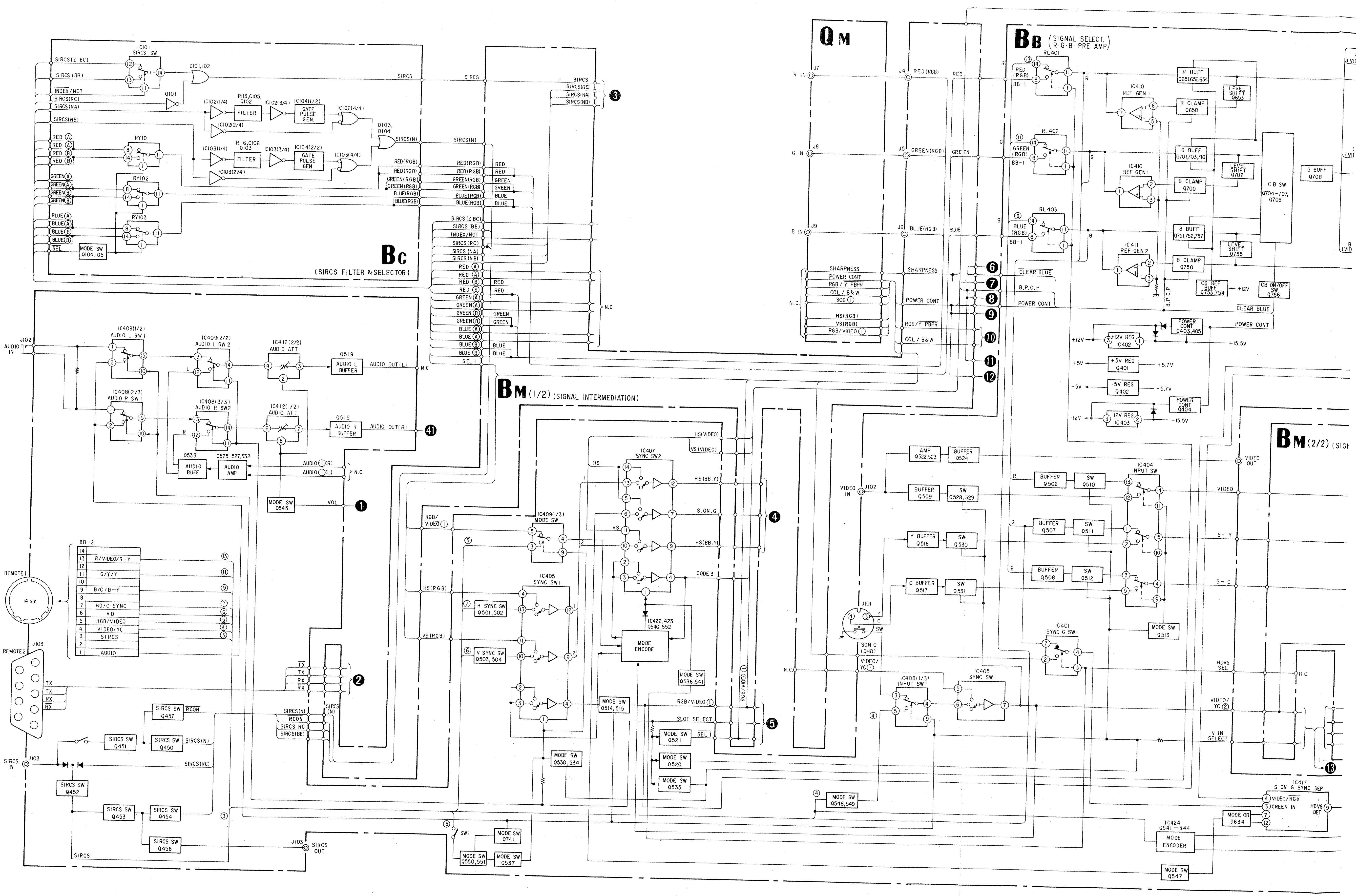
BOARD ITEM	BA	BB	BC	BM	QM	CA(RG)	CA(B)	CBR	CBG
CIRCUIT DESCRIPTION	125	129	191	–	–	133	133	–	–
ADJUSTMENT	213	–	–	–	–	–	–	–	–
BLOCK DIAGRAM	221	219	219	219	–	231	231	232	232
SCHEMATIC DIAGRAM	239	254	264	274	274	284	270	293	293
PRINTED WIRING BOARD	249	262	267	279	282	290	272	295	295
ELECTRICAL PARTS LIST	402	407	401	401	413	416	418	415	415

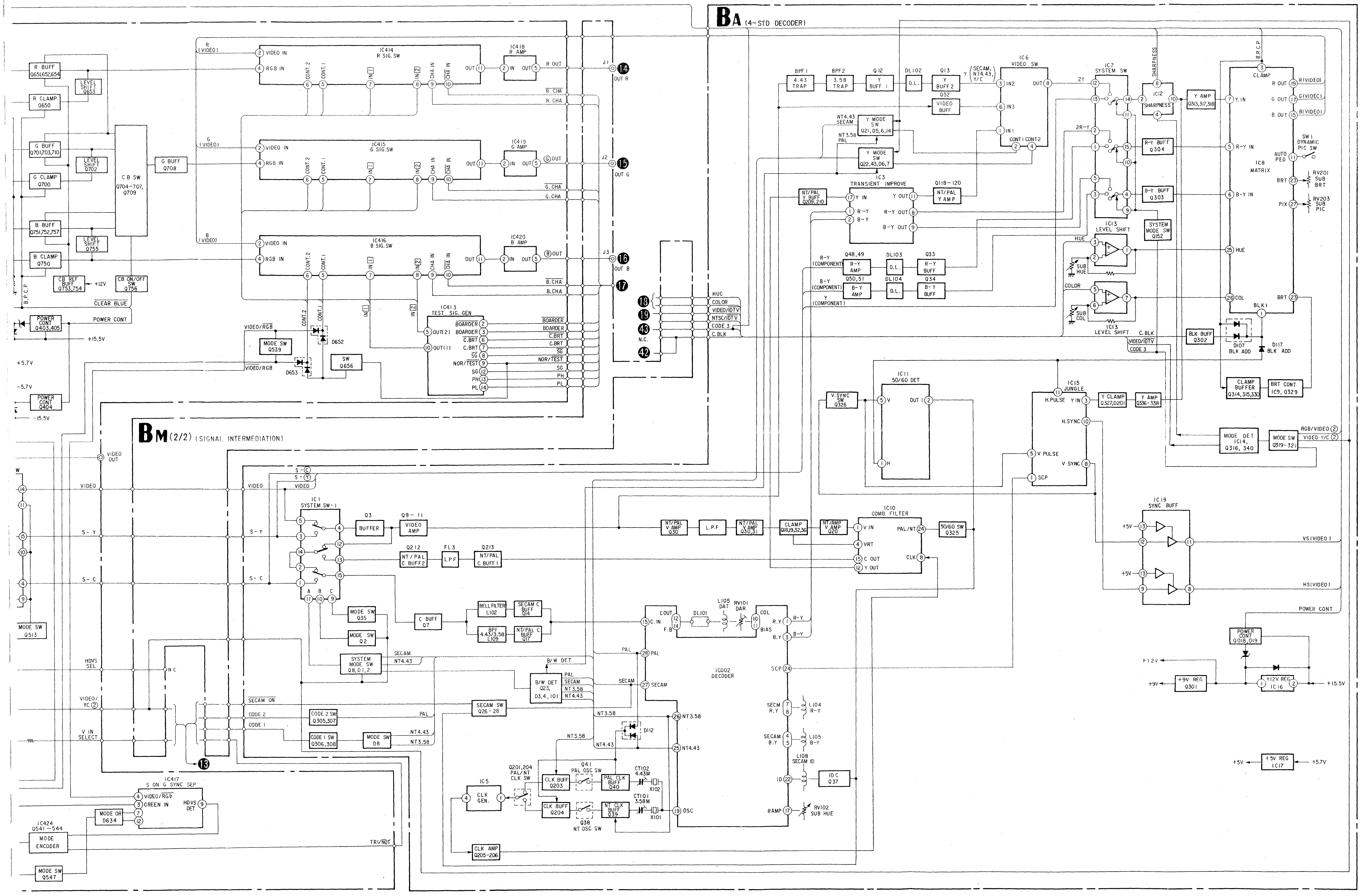
BOARD ITEM	CBB	CFA	CFB	DA	DB	DC	DF	DM	E
CIRCUIT DESCRIPTION	–	–	–	140	149	151	–	–	153
ADJUSTMENT	–	–	–	215	–	–	–	–	215
BLOCK DIAGRAM	232	231	231	226	227	228	228	–	229
SCHEMATIC DIAGRAM	293	297	297	301	327	336	353	346	356
PRINTED WIRING BOARD	296	299	300	305	332	343	353	351	363
ELECTRICAL PARTS LIST	415	414	414	420	426	430	420	420	434

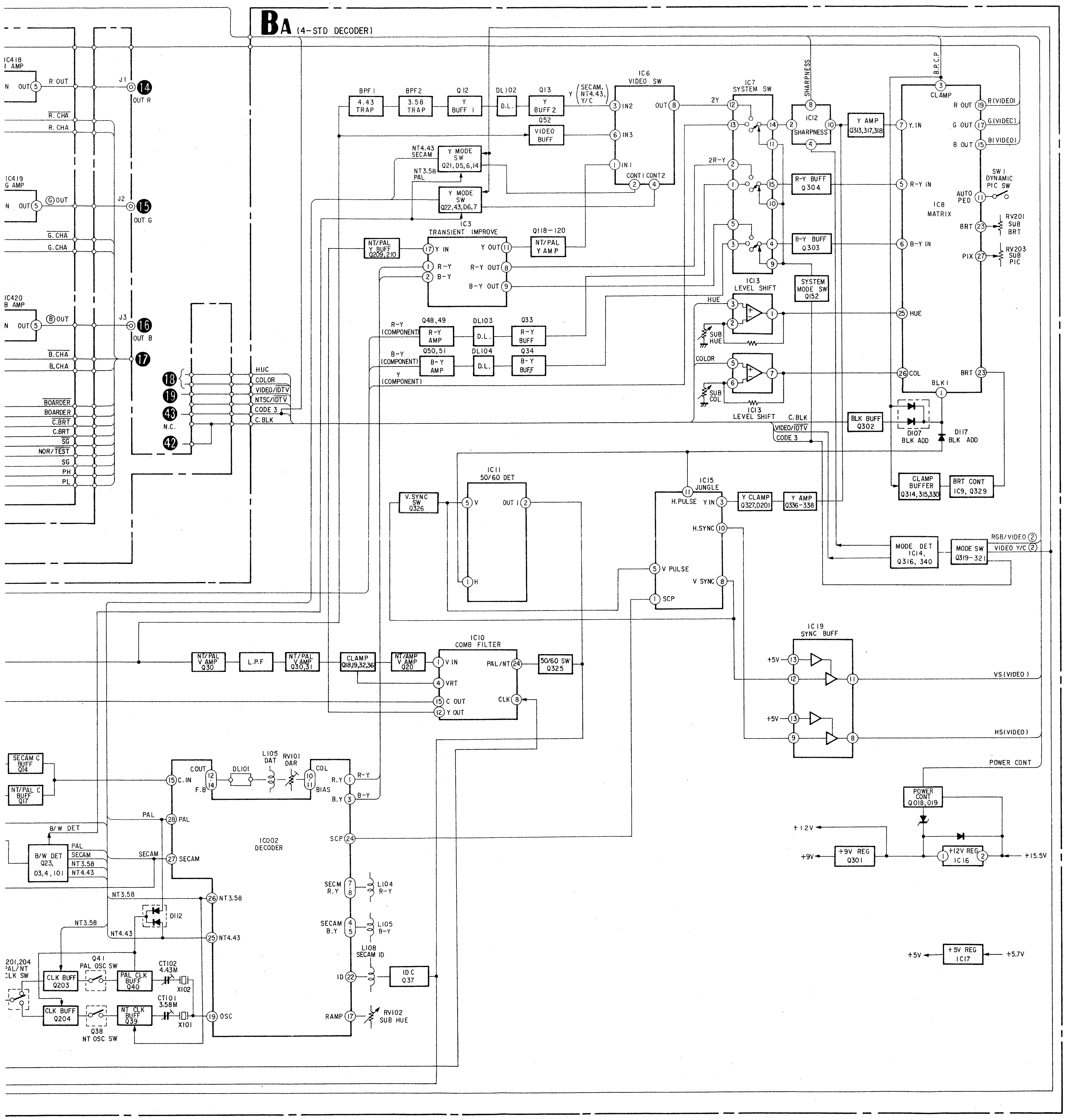
BOARD ITEM	K	KA	L	NA	NB	PA	PB	RC	RCA
CIRCUIT DESCRIPTION	176	191	193	–	–	167	–	–	–
ADJUSTMENT	–	–	–	–	–	–	–	–	–
BLOCK DIAGRAM	230	230	230	224	224	230	232	225	–
SCHEMATIC DIAGRAM	366	266	265	297	297	367	367	375	375
PRINTED WIRING BOARD	373	268	268	300	300	371	373	377	377
ELECTRICAL PARTS LIST	438	439	440	439	439	411	411	413	414

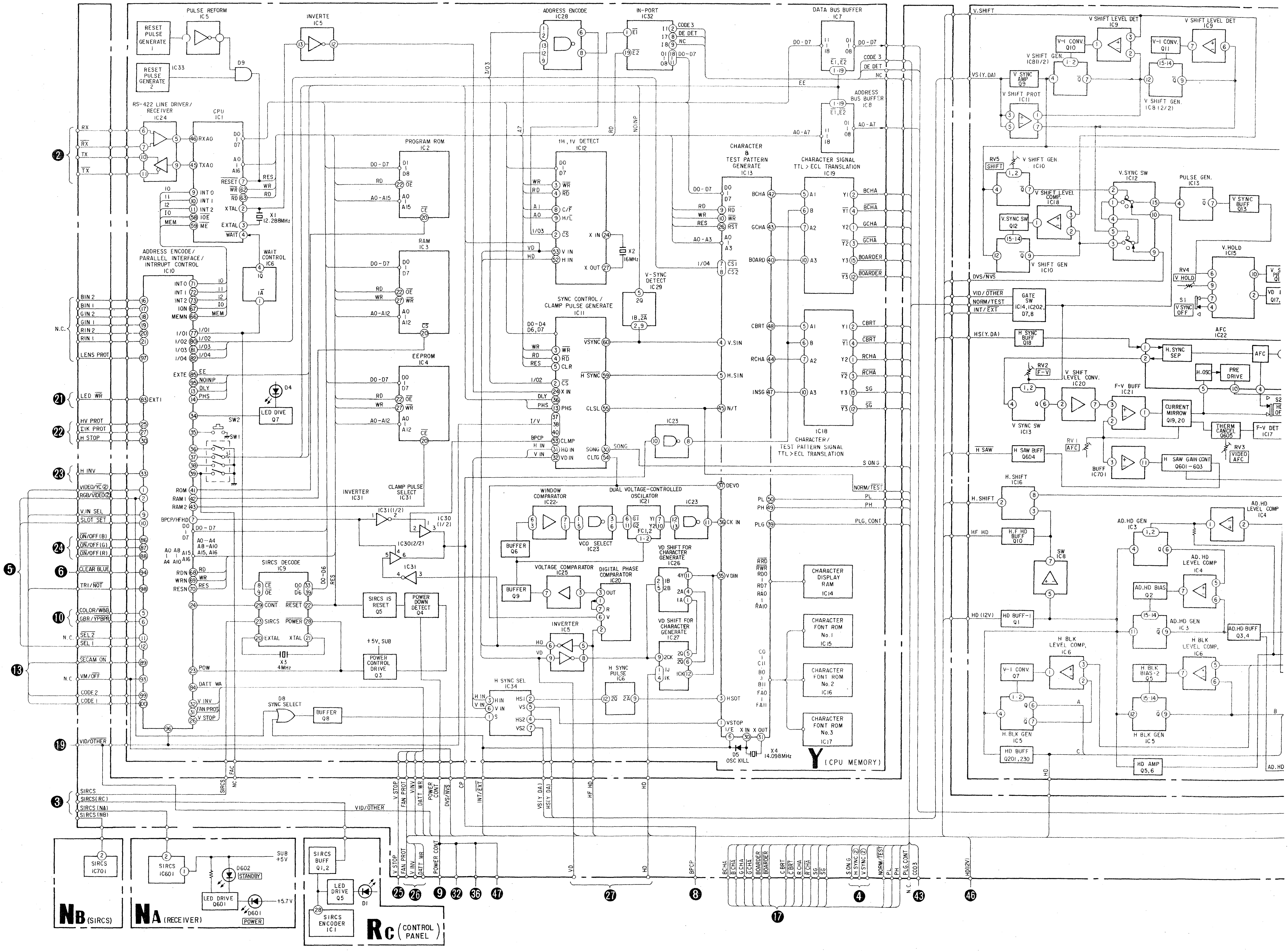
BOARD ITEM	RCB	RCC	RCD	Y	M1	M2	C1	C2	M3B
CIRCUIT DESCRIPTION	–	–	–	177	200	200	200	200	–
ADJUSTMENT	–	–	–	–	–	–	–	–	–
BLOCK DIAGRAM	–	–	–	224	229	229	229	230	229
SCHEMATIC DIAGRAM	375	375	374	313	380	386	380	386	380
PRINTED WIRING BOARD	377	377	378	323	383	389	385	391	385
ELECTRICAL PARTS LIST	414	414	414	440	443	445	444	447	–

7-3. BLOCK DIAGRAMS


Bc
(SIRCS FILTER & SELECTOR)
IC101 SIRCS SW
D101,102
Q101
IC102(1/4)
FILTER
GATE PULSE GEN.
D103, D104
RY101
RY102
RY103
MODE SW Q104,105
SIRCS(Z BC)
SIRCS(BB)
INDEX/NOT
SIRCS(RC)
SIRCS(NA)
SIRCS(NB)
RED(RGB)
GREEN(RGB)
BLUE(RGB)
N.C
AUDIO IN
J102
IC409(1/2) AUDIO L SW1
IC409(2/2) AUDIO L SW2
IC412(2/2) AUDIO ATT
Q519 AUDIO L BUFFER
AUDIO OUT(L)
IC408(2/3) AUDIO R SW1
IC408(3/3) AUDIO R SW2
IC412(1/2) AUDIO ATT
Q518 AUDIO R BUFFER
AUDIO OUT(R)
Q533 AUDIO BUFF
Q525-527,532 AUDIO AMP
MODE SW Q545
VOL
REMOTE 1
14 pin
BB-2
R/VIDEO/R-Y
G/Y/Y
B/C/B-Y
HD/C SYNC
VD
RGB/VIDEO
VIDEO/YC
SIRCS
AUDIO
REMOTE 2
J103
TX
RX
SIRCS SW Q457
SIRCS SW Q451
SIRCS SW Q450
SIRCS IN
SIRCS SW Q452
SIRCS SW Q453
SIRCS SW Q454
SIRCS SW Q456
SIRCS OUT
Bm(1/2) (SIGNAL INTERMEDIATION)
IC409(1/3) MODE SW
IC405 SYNC SW1
H SYNC SW Q501,502
V SYNC SW Q503,504
IC407 SYNC SW2
IC422,423 Q540,552
MODE ENCODE
MODE SW Q536,541
MODE SW Q514,515
MODE SW Q521
MODE SW Q520
MODE SW Q535
MODE SW Q538,534
MODE SW Q548,549
SW1
MODE SW Q741
MODE SW Q550,551
MODE SW Q537
HS(VIDEO)
VS(VIDEO)
HS(BB,Y)
S.ON.G
CODE 3
RGB/VIDEO
SLOT SELECT
SEL 1
Qm
R IN
G IN
B IN
J7
J8
J9
J4 RED(RGB)
J5 GREEN(RGB)
J6 BLUE(RGB)
SHARPNESS
POWER CONT
RGB/Y PBPR
COL/B&W
SOG
HS(RGB)
VS(RGB)
Bb (SIGNAL SELECT, R·G·B PRE AMP)
RL401
RL402
RL403
IC410 REF GEN 1
IC411 REF GEN 2
R BUFF Q651,652,654
LEVEL SHIFT Q653
R CLAMP Q650
G BUFF Q701,703,710
LEVEL SHIFT Q702
G CLAMP Q700
B BUFF Q751,752,757
LEVEL SHIFT Q755
B CLAMP Q750
CB SW Q704-707, Q709
G BUFF Q708
CB REF BUFF Q753,754
CB ON/OFF SW Q756
CLEAR BLUE
B.P.C.P
POWER CONT
POWER CONT Q403,405
+12V REG IC402
+5V REG Q401
-5V REG Q402
POWER CONT Q404
-12V REG IC403
+15.5V
+5.7V
-5.7V
-15.5V
Bm(2/2)
VIDEO IN
J102
AMP Q522,523
BUFFER Q524
BUFFER Q509
SW Q528,529
Y BUFFER Q516
SW Q530
C BUFFER Q517
SW Q531
J101
SON G (QHD)
VIDEO/YC
IC408(1/3) INPUT SW1
IC405 SYNC SW1
BUFFER Q506
SW Q510
BUFFER Q507
SW Q511
BUFFER Q508
SW Q512
IC404 INPUT SW
MODE SW Q513
IC401 SYNC G SW1
VIDEO OUT
VIDEO
S-Y
S-C
HDVS SEL
V IN SELECT
IC417 S ON G SYNC SEP
VIDEO/RGB
GREEN IN
HDVS DET
MODE OR D634
IC424 Q541-544 MODE ENCODER
MODE SW Q547
N.C.


BA (4-STD DECODER)
BM (2/2) (SIGNAL INTERMEDIATION)
R BUFF Q651,652,654
LEVEL SHIFT Q653
R CLAMP Q650
G BUFF Q701,703,710
LEVEL SHIFT Q702
G CLAMP Q700
B BUFF Q751,752,757
LEVEL SHIFT Q755
B CLAMP Q750
C B SW Q704-707, Q709
G BUFF Q708
CB REF BUFF Q753,754
CB ON/OFF SW Q756
CLEAR BLUE
POWER CONT Q403,405
POWER CONT Q404
+15.5V
+5.7V
-5.7V
-15.5V
IC414 R SIG. SW
IC415 G SIG. SW
IC416 B SIG. SW
IC418 R AMP
IC419 G AMP
IC420 B AMP
VIDEO IN
RGB IN
CONT.2
CONT.1
CHA IN
OUT R
OUT G
OUT B
R.CHA
G.CHA
B.CHA
IC413 TEST SIG. GEN
BOARDER
C.BRT
SG
NOR/TEST
PH
PL
MODE SW Q539
SW Q656
D652
D653
VIDEO/RGB
HUC
COLOR
VIDEO/IDTV
NTSC/IDTV
CODE 3
C.BLK
N.C.
BPF1 4.43 TRAP
BPF2 3.58 TRAP
Q12 Y BUFF 1
DL102 D.L.
Q13 Y BUFF 2
Q52 VIDEO BUFF
IC6 VIDEO SW
Y MODE SW Q21,D5,6,14
Y MODE SW Q22,43,D6,7
NT4.43 SECAM
NT3.58 PAL
IC3 TRANSIENT IMPROVE
NT/PAL Y BUFF Q209,210
Q118-120 NT/PAL Y AMP
Q48,49 R-Y AMP
Q50,51 B-Y AMP
DL103 D.L.
DL104 D.L.
Q33 R-Y BUFF
Q34 B-Y BUFF
R-Y (COMPONENT)
B-Y (COMPONENT)
Y (COMPONENT)
IC7 SYSTEM SW
IC12 SHARPNESS
Y AMP Q313,317,318
R-Y BUFF Q304
B-Y BUFF Q303
SYSTEM MODE SW Q152
IC13 LEVEL SHIFT
HUE
SUB HUE
COLOR
SUB COL
IC8 MATRIX
CLAMP
B.P.C.P.
R OUT
G OUT
B OUT
R(VIDEO)
G(VIDEO)
B(VIDEO)
SW1 DYNAMIC PIC SW
AUTO PED
BRT
PIX
RV201 SUB BRT
RV203 SUB PIC
BLK1
BLK BUFF Q302
D107 BLK ADD
D117 BLK ADD
CLAMP BUFFER Q314,315,330
BRT CONT IC9, Q329
IC11 50/60 DET
V.SYNC SW Q326
IC15 JUNGLE
H.PULSE
Y IN
H.SYNC
V PULSE
V SYNC
SCP
Y CLAMP Q327,D201
Y AMP Q336-338
MODE DET IC14, Q316,340
MODE SW Q319-321
RGB/VIDEO
VIDEO Y/C
IC19 SYNC BUFF
VS(VIDEO)
HS(VIDEO)
POWER CONT
POWER CONT Q018,019
+12V
+9V
+9V REG Q301
+12V REG IC16
+15.5V
+5V
+5V REG IC17
+5.7V
VIDEO OUT
VIDEO
S-Y
S-C
S-(C)
S-(Y)
IC1 SYSTEM SW-1
Q3 BUFFER
Q9-11 VIDEO AMP
Q212 NT/PAL C BUFF2
FL3 LPF
Q213 NT/PAL C BUFF1
NT/PAL V AMP Q30
L.P.F
NT/PAL V AMP Q30,31
CLAMP Q18,19,32,36
NT/AMP V AMP Q20
IC10 COMB FILTER
V IN
VRT
C OUT
Y OUT
PAL/NT
CLK
50/60 SW Q325
MODE SW Q35
MODE SW Q2
C BUFF Q7
BELL FILTER L102
SECAM C BUFF Q14
BPF 4.43/3.58 L109
NT/PAL C BUFF Q17
SYSTEM MODE SW Q8,D1,2
B/W DET Q23, D3,4,101
SECAM SW Q26-28
CODE 2 SW Q305,307
CODE 1 SW Q306,308
MODE SW D8
IC002 DECODER
C.IN
F.B
COUT
DL101
L105 DAT
RV101 DAR
COL
BIAS
R.Y
B.Y
SECM R.Y
SECAM B.Y
L104 R-Y
L105 B-Y
L108 SECAM ID
ID
ID C Q37
RAMP
RV102 SUB HUE
PAL
SECAM
NT3.58
NT4.43
OSC
IC5 CLK GEN.
Q201,204 PAL/NT CLK SW
CLK BUFF Q203
CLK BUFF Q204
Q41 PAL OSC SW
Q38 NT OSC SW
PAL CLK BUFF Q40
NT CLK BUFF Q39
CT102 4.43M X102
CT101 3.58M X101
D112
CLK AMP Q205-206
HDVS SEL
VIDEO/YC
V IN SELECT
N C
SECAM ON
CODE 2
CODE 1
IC417 S ON G SYNC SEP
VIDEO/RGB
SCREEN IN
HDVS DET
IC424 Q541-544 MODE ENCODER
MODE OR D634
MODE SW Q547
MODE SW Q513
TRI/NOT
14
15
16
17
18
19
43
42
13


BA (4-STD DECODER)
IC418 R AMP
IC419 G AMP
IC420 B AMP
R OUT
OUT R
OUT G
OUT B
R.CHA
G.CHA
B.CHA
BOARDER
C.BRT
SG
NOR/TEST
PH
PL
HUC
COLOR
VIDEO/IDTV
NTSC/IDTV
CODE 3
C.BLK
N.C.
BPF1 4.43 TRAP
BPF2 3.58 TRAP
Q12 Y BUFF 1
DL102 D.L.
Q13 Y BUFF 2
SECAM, NT4.43, Y/C
IC6 VIDEO SW
Q52 VIDEO BUFF
Y MODE SW Q21,D5,6,14
Y MODE SW Q22,43,D6,7
NT4.43 SECAM
NT3.58 PAL
CONT1 CONT2
IC3 TRANSIENT IMPROVE
NT/PAL Y BUFF Q209,210
Q118-120 NT/PAL Y AMP
R-Y (COMPONENT)
B-Y (COMPONENT)
Y (COMPONENT)
Q48,49 R-Y AMP
Q50,51 B-Y AMP
DL103 D.L.
DL104 D.L.
Q33 R-Y BUFF
Q34 B-Y BUFF
IC7 SYSTEM SW
2Y
2R-Y
SHARPNESS
IC12 SHARPNESS
Y AMP Q313,317,318
R-Y BUFF Q304
B-Y BUFF Q303
SYSTEM MODE SW Q152
IC13 LEVEL SHIFT
HUE
SUB HUE
COLOR
SUB COL
BLK BUFF Q302
D107 BLK ADD
D117 BLK ADD
B.P.C.P
CLAMP
IC8 MATRIX
Y.IN
R-Y IN
B-Y IN
R OUT R(VIDEO)
G OUT G(VIDEO)
B OUT B(VIDEO)
SW1 DYNAMIC PIC SW
AUTO PED
BRT
PIX
RV201 SUB BRT
RV203 SUB PIC
HUE
COL
BLK1
CLAMP BUFFER Q314,315,330
BRT CONT IC9, Q329
IC11 50/60 DET
V.SYNC SW Q326
IC15 JUNGLE
H.PULSE
Y IN
H.SYNC
V PULSE
V SYNC
SCP
Y CLAMP Q327,D201
Y AMP Q336-338
MODE DET IC14, Q316, 340
MODE SW Q319-321
RGB/VIDEO
VIDEO Y/C
IC19 SYNC BUFF
+5V
VS(VIDEO)
HS(VIDEO)
POWER CONT
POWER CONT Q018,019
+12V
+9V
+9V REG Q301
+12V REG IC16
+15.5V
+5V REG IC17
+5.7V
NT/PAL V.AMP Q30
L.P.F
NT/PAL V.AMP Q30,31
CLAMP Q18,19,32,36
NT/AMP V.AMP Q20
IC10 COMB FILTER
V IN
VRT
C OUT
Y OUT
PAL/NT
CLK
50/60 SW Q325
SECAM C BUFF Q14
NT/PAL C BUFF Q17
C.IN
COUT
F.B
DL101
L105 DAT
RV101 DAR
COL
BIAS
R.Y
B.Y
R-Y
B-Y
PAL
SECAM
B/W DET
B/W DET Q23, D3,4,101
NT3.58
NT4.43
IC002 DECODER
SCP
SECM R.Y
L104 R-Y
SECAM B.Y
L105 B-Y
L108 SECAM ID
ID
IDC Q37
RAMP
RV102 SUB HUE
D112
OSC
Q41 PAL OSC SW
CLK BUFF Q203
PAL CLK BUFF Q40
CT102 4.43M
X102
CLK BUFF Q204
NT CLK BUFF Q39
CT101 3.58M
X101
Q38 NT OSC SW
201,204 PAL/NT CLK SW


PULSE REFORM IC5
RESET PULSE GENERATE 1
RESET PULSE GENERATE 2
IC33
D9
INVERTE IC5
ADDRESS ENCODE IC28
IN-PORT IC32
DATA BUS BUFFER IC7
ADDRESS BUS BUFFER IC8
RS-422 LINE DRIVER/RECEIVER IC24
CPU IC1
X1 12.288MHz
PROGRAM ROM IC2
RAM IC3
EEPROM IC4
1H, 1V DETECT IC12
X2 16MHz
V-SYNC DETECT IC29
SYNC CONTROL / CLAMP PULSE GENERATE IC11
CHARACTER & TEST PATTERN GENERATE IC13
CHARACTER SIGNAL TTL > ECL TRANSLATION IC19
IC18
CHARACTER / TEST PATTERN SIGNAL TTL > ECL TRANSLATION
ADDRESS ENCODE / PARALLEL INTERFACE / INTRRUPT CONTROL IC10
WAIT CONTROL IC6
LED DIVE Q7
D4
SW1
SW2
INVERTER IC31
CLAMP PULSE SELECT IC31
IC30
WINDOW COMPARATOR IC22
DUAL VOLTAGE-CONTROLLED OSCILATOR IC21
IC23
VCO SELECT IC23
BUFFER Q6
BUFFER Q9
VOLTAGE COMPARATOR IC25
DIGITAL PHASE COMPARATOR IC20
VD SHIFT FOR CHARACTER GENERATE IC26
VD SHIFT FOR CHARACTER GENERATE IC27
INVERTER IC5
H SYNC SEL IC34
H SYNC PULSE IC6
CHARACTER DISPLAY RAM IC14
CHARACTER FONT ROM No.1 IC15
CHARACTER FONT ROM No.2 IC16
CHARACTER FONT ROM No.3 IC17
X4 14.098MHz
D5 OSC KILL
Y (CPU MEMORY)
SIRCS DECODE IC9
X3 4MHz
SIRCS IS RESET Q5
POWER DOWN DETECT Q4
+5V, SUB
POWER CONTROL DRIVE Q3
D8 SYNC SELECT
BUFFER Q8
SIRCS IC701
NB (SIRCS)
SIRCS IC601
D602 STANDBY
LED DRIVE Q601
D601 POWER
SUB +5V
+5.7V
NA (RECEIVER)
SIRCS BUFF Q1,2
LED DRIVE Q5
D1
SIRCS ENCODER IC1
Rc (CONTROL PANEL)
V.SHIFT
V SHIFT LEVEL DET IC9
V-I CONV. Q10
V-I CONV. Q11
V SHIFT GEN IC8(1/2)
V SHIFT GEN IC8(2/2)
V SYNC AMP Q9
V SHIFT PROT IC11
RV5 SHIFT
V SHIFT GEN IC10
V SHIFT LEVEL COMP IC18
V.SYNC SW Q12
V.SYNC SW IC12
PULSE GEN. IC13
V SYNC BUFF Q13
V.HOLD IC15
RV4 V HOLD
S1 V SYNC OFF
GATE SW IC14, IC202, D7,8
H SYNC BUFF Q18
H. SYNC SEP
AFC IC22
AFC
H.OSC
PRE DRIVE
RV2 F-V
V SHIFT LEVEL CONV. IC20
F-V BUFF IC21
CURRENT MIRROR Q19, 20
THERM CANCEL Q605
F-V DET IC7
V SYNC SW IC13
RV1 AFC
BUFF IC701
H SAW BUFF Q604
H SAW GAIN CONT Q601-603
RV3 VIDEO AFC
H. SHIFT IC16
H.F HD BUFF Q10
SW IC8
AD.HD GEN IC3
AD.HD LEVEL COMP IC4
AD. HD BIAS Q2
AD. HD GEN IC3
AD.HD BUFF Q3,4
HD BUFF-1 Q1
H BLK LEVEL COMP. IC6
V-I CONV. Q7
H. BLK GEN IC5
HD BUFF Q201, 230
H BLK BIAS-2 Q5
HD AMP Q5,6
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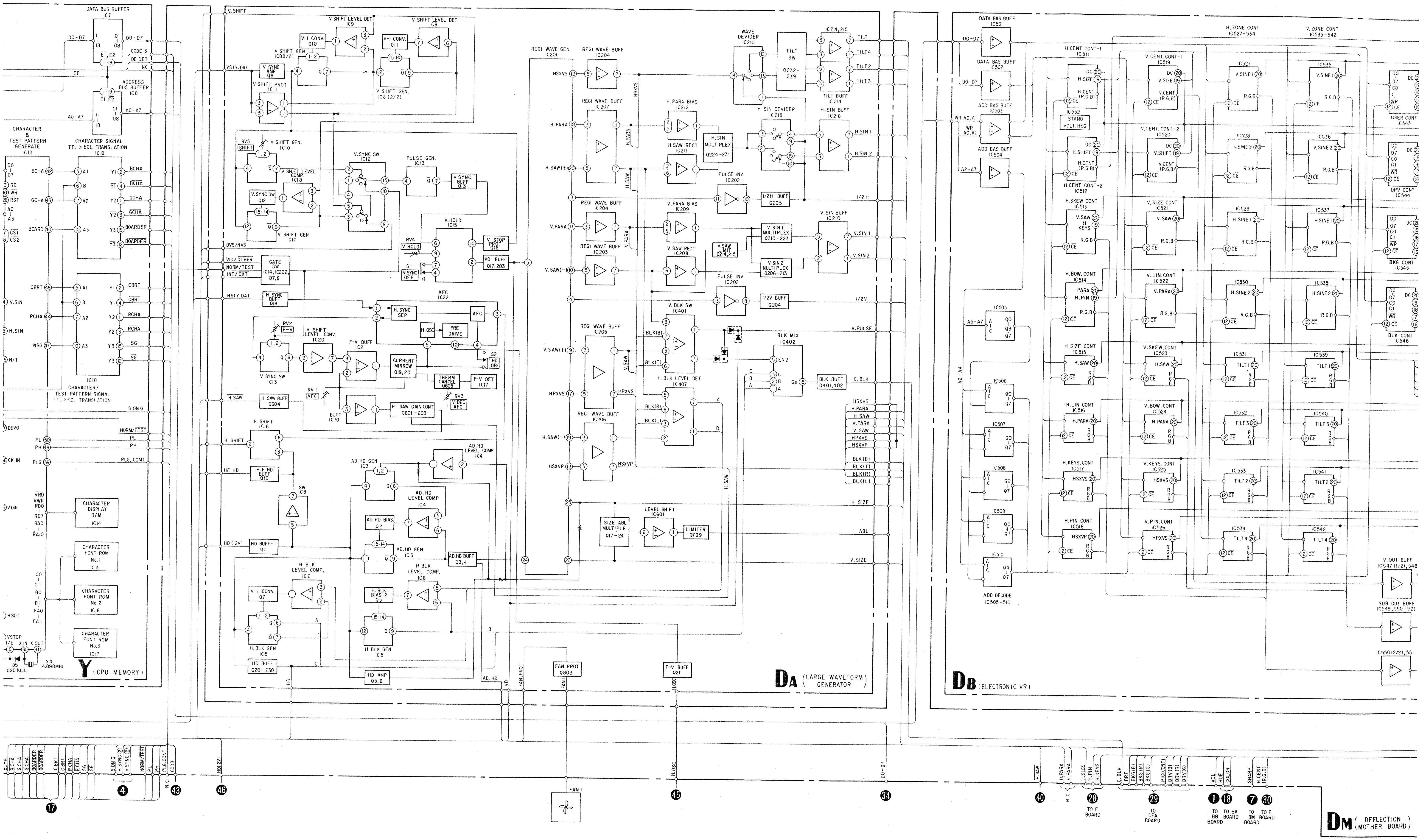
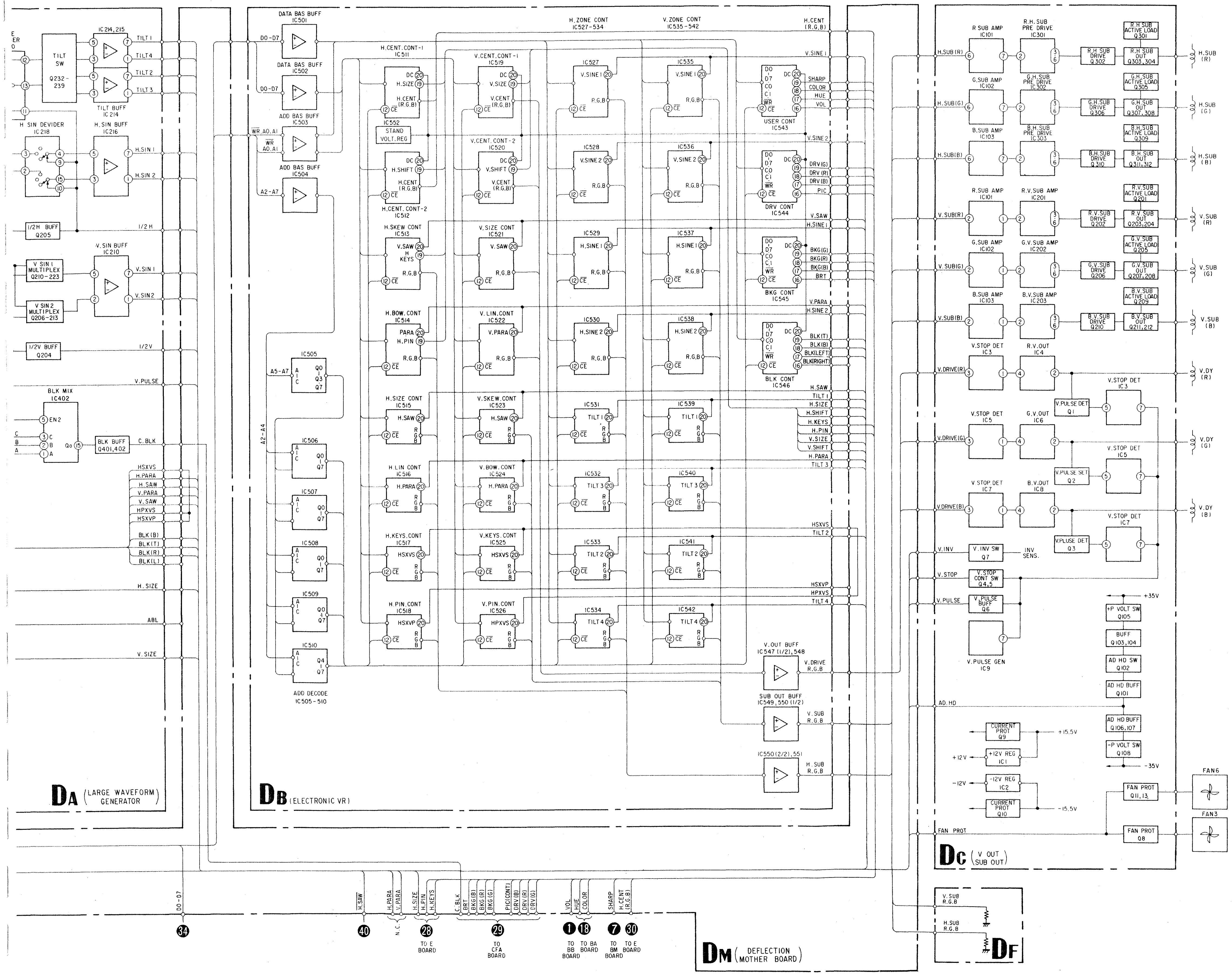
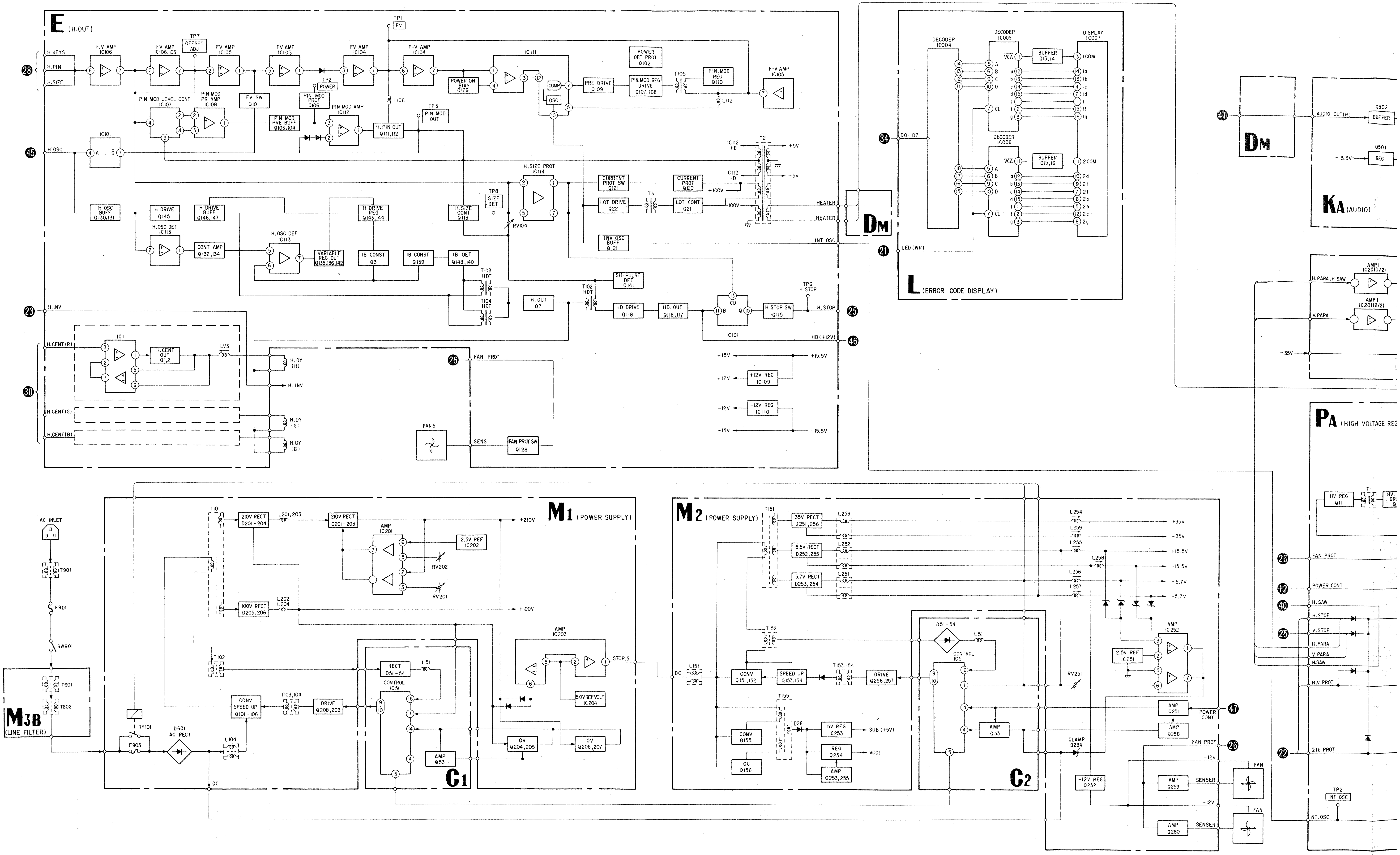

DATA BUS BUFFER IC7
ADDRESS BUS BUFFER IC8
CHARACTER & TEST PATTERN GENERATE IC13
CHARACTER SIGNAL TTL > ECL TRANSLATION IC19
CHARACTER / TEST PATTERN SIGNAL TTL > ECL TRANSLATION IC18
CHARACTER DISPLAY RAM IC14
CHARACTER FONT ROM No.1 IC15
CHARACTER FONT ROM No.2 IC16
CHARACTER FONT ROM No.3 IC17
Q5 OSC KILL
X4 14.098MHz
Y (CPU MEMORY)
V SHIFT LEVEL DET IC9
V-I CONV. Q10
V-I CONV. Q11
V SHIFT GEN IC8(1/2)
V SHIFT GEN. IC8(2/2)
V SYNC AMP Q9
V SHIFT PROT IC11
V SHIFT GEN. IC10
V SHIFT LEVEL COMP IC18
V SYNC SW IC12
PULSE GEN. IC13
V SYNC BUFF Q13
V.HOLD IC15
V STOP PROT Q16
VD BUFF Q17,203
GATE SW IC14,IC202, D7,8
H SYNC BUFF Q18
AFC IC22
H.SYNC SEP
H.OSC
PRE DRIVE
V SHIFT LEVEL CONV. IC20
F-V BUFF IC21
CURRENT MIRROW Q19,20
THERM CANCEL Q605
F-V DET IC17
H SAW BUFF Q604
H SAW GAIN CONT Q601-603
H. SHIFT IC16
H.F HD BUFF Q10
SW IC8
HD BUFF-I Q1
AD.HD GEN IC3
AD.HD LEVEL COMP IC4
AD.HD BIAS Q2
AD.HD GEN IC3
AD.HD BUFF Q3,4
H BLK LEVEL COMP. IC6
V-I CONV. Q7
H.BLK GEN IC5
H.BLK BIAS-2 Q5
HD BUFF Q201,230
HD AMP Q5,6
FAN PROT Q803
F-V BUFF Q21
REGI WAVE GEN IC201
REGI WAVE BUFF IC204
REGI WAVE BUFF IC207
REGI WAVE BUFF IC203
REGI WAVE BUFF IC205
REGI WAVE BUFF IC206
H.PARA BIAS IC212
H SAW RECT IC211
H.SIN MULTIPLEX Q224-231
PULSE INV IC202
1/2H BUFF Q205
V.PARA BIAS IC209
V.SAW RECT IC208
V.SAW LIMIT Q214,215
V SIN 1 MULTIPLEX Q210-223
V SIN 2 MULTIPLEX Q206-213
V SIN BUFF IC210
1/2V BUFF Q204
WAVE DEVIDER IC210
TILT SW Q232-239
TILT BUFF IC214
H SIN DEVIDER IC218
H.SIN BUFF IC216
V. BLK SW IC401
H. BLK LEVEL DET IC407
BLK MIX IC402
BLK BUFF Q401,402
SIZE ABL MULTIPLE Q17-24
LEVEL SHIFT IC601
LIMITER Q709
DA (LARGE WAVEFORM GENERATOR)
DATA BAS BUFF IC501
DATA BAS BUFF IC502
ADD BAS BUFF IC503
ADD BAS BUFF IC504
ADD DECODE IC505-510
H.CENT.CONT-1 IC511
STAND VOLT.REG
H.CENT. CONT-2 IC512
H.SKEW CONT IC513
H.BOW. CONT IC514
H.SIZE CONT IC515
H.LIN CONT IC516
H.KEYS.CONT IC517
H.PIN.CONT IC518
V.CENT.CONT-1 IC519
V.CENT.CONT-2 IC520
V.SIZE CONT IC521
V.LIN.CONT IC522
V.SKEW.CONT IC523
V.BOW.CONT IC524
V.KEYS. CONT IC525
V.PIN.CONT IC526
H.ZONE CONT IC527-534
V.ZONE CONT IC535-542
USER CONT IC543
DRV CONT IC544
BKG CONT IC545
BLK CONT IC546
V.OUT BUFF IC547 (1/2),548
SUB OUT BUFF IC549,550 (1/2)
IC550(2/2),551
DB (ELECTRONIC VR)
FAN 1
TO E BOARD
TO CFA BOARD
TO BB BOARD
TO BA BOARD
TO BM BOARD
TO E BOARD
DM (DEFLECTION MOTHER BOARD)
17
4
43
46
45
34
40
28
29
1
18
7
30


DA (LARGE WAVEFORM GENERATOR)
TILT SW Q232-239
IC214, 215
TILT BUFF IC214
TILT 1
TILT 4
TILT 2
TILT 3
H SIN DEVIDER IC218
H.SIN BUFF IC216
H.SIN 1
H.SIN 2
1/2H BUFF Q205
1/2 H
V.SIN BUFF IC210
V SIN 1 MULTIPLEX Q210-223
V SIN 2 MULTIPLEX Q206-213
V.SIN 1
V.SIN 2
1/2V BUFF Q204
1/2V
V.PULSE
BLK MIX IC402
EN2
BLK BUFF Q401, 402
C.BLK
HSXVS
H.PARA
H.SAW
V.PARA
V.SAW
HPXVS
HSXVP
BLK(B)
BLK(T)
BLK(R)
BLK(L)
H.SIZE
ABL
V.SIZE
DB (ELECTRONIC VR)
DATA BAS BUFF IC501
DATA BAS BUFF IC502
ADD BAS BUFF IC503
ADD BAS BUFF IC504
D0-D7
WR. A0. A1
A2-A7
A5-A7
A2-A4
IC505
IC506
IC507
IC508
IC509
IC510
ADD DECODE IC505-510
H.CENT. CONT-1 IC511
H.CENT. CONT-2 IC512
STAND VOLT. REG IC552
H.SKEW CONT IC513
H.BOW. CONT IC514
H.SIZE CONT IC515
H LIN CONT IC516
H.KEYS. CONT IC517
H.PIN. CONT IC518
V.CENT. CONT-1 IC519
V.CENT. CONT-2 IC520
V.SIZE CONT IC521
V.LIN. CONT IC522
V.SKEW. CONT IC523
V.BOW. CONT IC524
V.KEYS. CONT IC525
V.PIN. CONT IC526
H.ZONE CONT IC527-534
V.ZONE CONT IC535-542
IC527
IC528
IC529
IC530
IC531
IC532
IC533
IC534
IC535
IC536
IC537
IC538
IC539
IC540
IC541
IC542
USER CONT IC543
DRV CONT IC544
BKG CONT IC545
BLK CONT IC546
H.CENT (R.G.B)
V.SINE 1
SHARP
COLOR
HUE
VOL
V.SINE 2
DRV(G)
DRV(R)
DRV(B)
PIC
V.SAW
H.SINE 1
BKG(G)
BKG(R)
BKG(B)
BRT
V.PARA
H.SINE 2
BLK(T)
BLK(B)
BLK(LEFT)
BLK(RIGHT)
H.SAW
TILT 1
H.SIZE
H.SHIFT
H.KEYS
H.PIN
V.SIZE
V.SHIFT
H.PARA
TILT 3
HSXVS
TILT 2
HSXVP
HPXVS
TILT 4
V.OUT BUFF IC547 (1/2), 548
V.DRIVE R.G.B
SUB OUT BUFF IC549, 550 (1/2)
V.SUB R.G.B
IC550 (2/2), 551
H.SUB R.G.B
DC (Dc) (V OUT SUB OUT)
R SUB AMP IC101
R.H.SUB PRE DRIVE IC301
R.H SUB DRIVE Q302
R.H SUB ACTIVE LOAD Q301
R.H SUB OUT Q303, 304
G.SUB AMP IC102
G.H.SUB PRE DRIVE IC302
G.H.SUB DRIVE Q306
G.H.SUB ACTIVE LOAD Q305
G.H.SUB OUT Q307, 308
B.SUB AMP IC103
B.H.SUB PRE DRIVE IC303
B.H.SUB DRIVE Q310
B.H.SUB ACTIVE LOAD Q309
B.H.SUB OUT Q311, 312
R.V.SUB AMP IC201
R.V.SUB DRIVE Q202
R.V.SUB ACTIVE LOAD Q201
R.V.SUB OUT Q203, 204
G.V.SUB AMP IC202
G.V.SUB DRIVE Q206
G.V.SUB ACTIVE LOAD Q205
G.V.SUB OUT Q207, 208
B.V.SUB AMP IC203
B.V.SUB DRIVE Q210
B.V.SUB ACTIVE LOAD Q209
B.V.SUB OUT Q211, 212
H.SUB(R)
H.SUB(G)
H.SUB(B)
V.SUB(R)
V.SUB(G)
V.SUB(B)
H.SUB (R)
H.SUB (G)
H.SUB (B)
V.SUB (R)
V.SUB (G)
V.SUB (B)
V.STOP DET IC3
R.V.OUT IC4
V.PULSE DET Q1
V.STOP DET IC5
G.V.OUT IC6
V.PULSE SET Q2
V.STOP DET IC7
B.V.OUT IC8
V.PLUSE DET Q3
V.DRIVE(R)
V.DRIVE(G)
V.DRIVE(B)
V.DY (R)
V.DY (G)
V.DY (B)
V.INV
V.INV SW Q7
INV SENS.
V.STOP
V.STOP CONT SW Q4,5
V.PULSE
V.PULSE BUFF Q6
V.PULSE GEN IC9
+35V
+P VOLT SW Q105
BUFF Q103, 104
AD HD SW Q102
AD HD BUFF Q101
AD HD BUFF Q106, 107
-P VOLT SW Q108
-35V
AD. HD
CURRENT PROT Q9
+15.5V
+12V
+12V REG IC1
-12V
-12V REG IC2
CURRENT PROT Q10
-15.5V
FAN PROT Q11, 13
FAN PROT Q8
FAN PROT
FAN6
FAN3
V.SUB R.G.B
H.SUB R.G.B
DF
DM (DEFLECTION MOTHER BOARD)
D0-D7
H.SAW
H.PARA
V.PARA
N.C
V.SIZE
H.PIN
H.KEYS
C.BLK
BRT
BKG(B)
BKG(R)
BKG(G)
PIC(CONT)
DRV(B)
DRV(R)
DRV(G)
VOL
HUE
COLOR
SHARP
H.CENT (R.G.B)
㉞
㊵
㉘
TO E BOARD
㉙
TO CFA BOARD
❶
⑱
TO BB BOARD
TO BA BOARD
❼
㉚
TO BM BOARD
TO E BOARD


E (H.OUT)
H.KEYS
H.PIN
H.SIZE
H.OSC
H.INV
H.CENT(R)
H.CENT(G)
H.CENT(B)
F.V AMP IC106
FV AMP IC106,103
TP7 OFFSET ADJ
FV AMP IC105
FV AMP IC103
FV AMP IC104
TP1 FV
F-V AMP IC104
IC111
POWER OFF PROT Q102
PIN MOD LEVEL CONT IC107
PIN MOD PR AMP IC108
FV SW Q101
TP2 POWER
PIN MOD PROT Q106
PIN MOD AMP IC112
PIN MOD PRE BUFF Q103,104
H.PIN OUT Q111,112
TP3 PIN MOD OUT
POWER ON BIAS Q129
COMP
OSC
PRE DRIVE Q109
PIN MOD REG DRIVE Q107,108
T105
PIN MOD REG Q110
L112
F-V AMP IC105
L106
IC101
H OSC BUFF Q130,131
H DRIVE Q145
H DRIVE BUFF Q146,147
H DRIVE REG Q143,144
H.OSC DET IC113
CONT AMP Q132,134
H.OSC DEF IC113
VARIABLE REG. OUT Q135,136,142
IB CONST Q3
IB CONST Q139
IB DET Q148,140
H.SIZE CONT Q113
TP8 SIZE DET
H.SIZE PROT IC114
RV104
CURRENT PROT SW Q121
CURRENT PROT Q120
LOT DRIVE Q22
T3
LOT CONT Q21
INV OSC BUFF Q121
IC112 +B
IC112 -B
T2
+5V
-5V
+100V
100V
HEATER
INT OSC
SH-PULSE DET Q141
T103 HDT
T104 HDT
H.OUT Q7
T102 HDT
HD DRIVE Q118
HD. OUT Q116,117
CD
H.STOP SW Q115
TP6 H.STOP
H.STOP
HD(+12V)
IC1
H.CENT OUT Q1,2
LV3
H.DY (R)
H.INV
H.DY (G)
H.DY (B)
FAN PROT
FAN5
SENS
FAN PROT SW Q128
+15V
+15.5V
+12V
+12V REG IC109
-12V
-12V REG IC110
-15V
-15.5V
DM
L (ERROR CODE DISPLAY)
DECODER IC004
DECODER IC005
DISPLAY IC007
BUFFER Q13,14
DECODER IC006
BUFFER Q15,16
1COM
2COM
D0-D7
LED (WR)
KA (AUDIO)
AUDIO OUT(R)
Q502 BUFFER
Q501 REG
-15.5V
AMP1 IC201(1/2)
AMP1 IC201(2/2)
H.PARA, H SAW
V.PARA
-35V
PA (HIGH VOLTAGE REG
HV REG Q11
T1
M1 (POWER SUPPLY)
AC INLET
T901
F901
SW901
M3B (LINE FILTER)
T601
T602
RY101
F903
D601 AC RECT
L104
DC
T101
210V RECT D201-204
L201,203
210V RECT Q201-203
+210V
AMP IC201
2.5V REF IC202
RV202
RV201
100V RECT D205,206
L202 L204
+100V
AMP IC203
STOP.S
5.0V REF VOLT IC204
T102
CONV SPEED UP Q101-106
T103,104
DRIVE Q208,209
RECT D51-54
L51
CONTROL IC51
AMP Q53
OV Q204,205
OV Q206,207
C1
M2 (POWER SUPPLY)
T151
35V RECT D251,256
L253
15.5V RECT D252,255
L252
5.7V RECT D253,254
L251
L254
L259
L255
L258
L256
L257
+35V
-35V
+15.5V
-15.5V
+5.7V
-5.7V
T152
L151
CONV Q151,152
SPEED UP Q153,154
T153,154
DRIVE Q256,257
T155
D281
5V REG IC253
SUB (+5V)
CONV Q155
REG Q254
VCC1
OC Q156
AMP Q253,255
D51-54
CONTROL IC51
AMP Q53
RV251
AMP IC252
2.5V REF IC251
AMP Q251
AMP Q258
POWER CONT
CLAMP D284
FAN PROT
-12V REG Q252
AMP Q259
SENSER
FAN
AMP Q260
C2
FAN PROT
POWER CONT
H.SAW
H.STOP
V.STOP
H.PARA
V.PARA
H.V PROT
Σ1k PROT
TP2 INT OSC
INT.OSC
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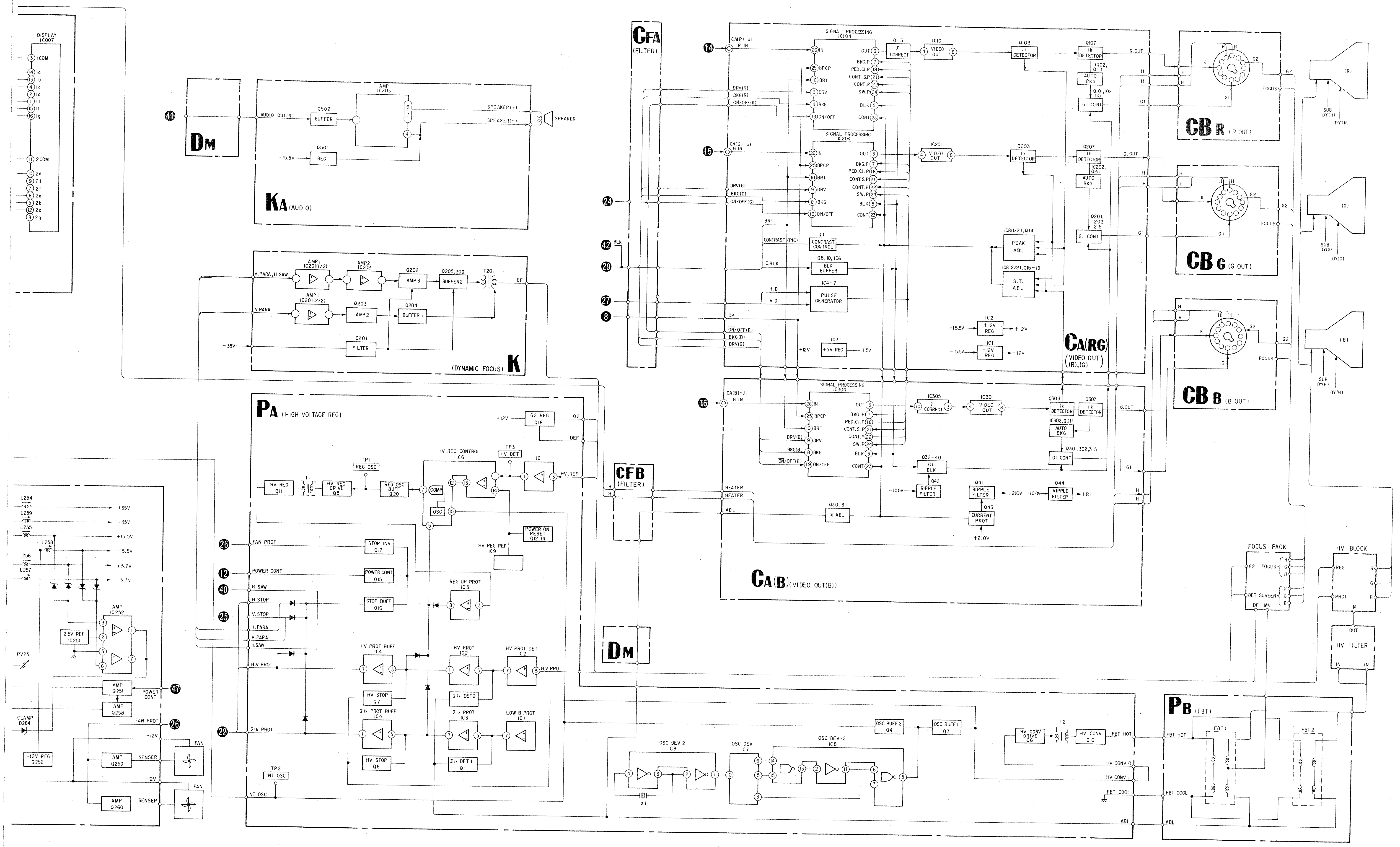
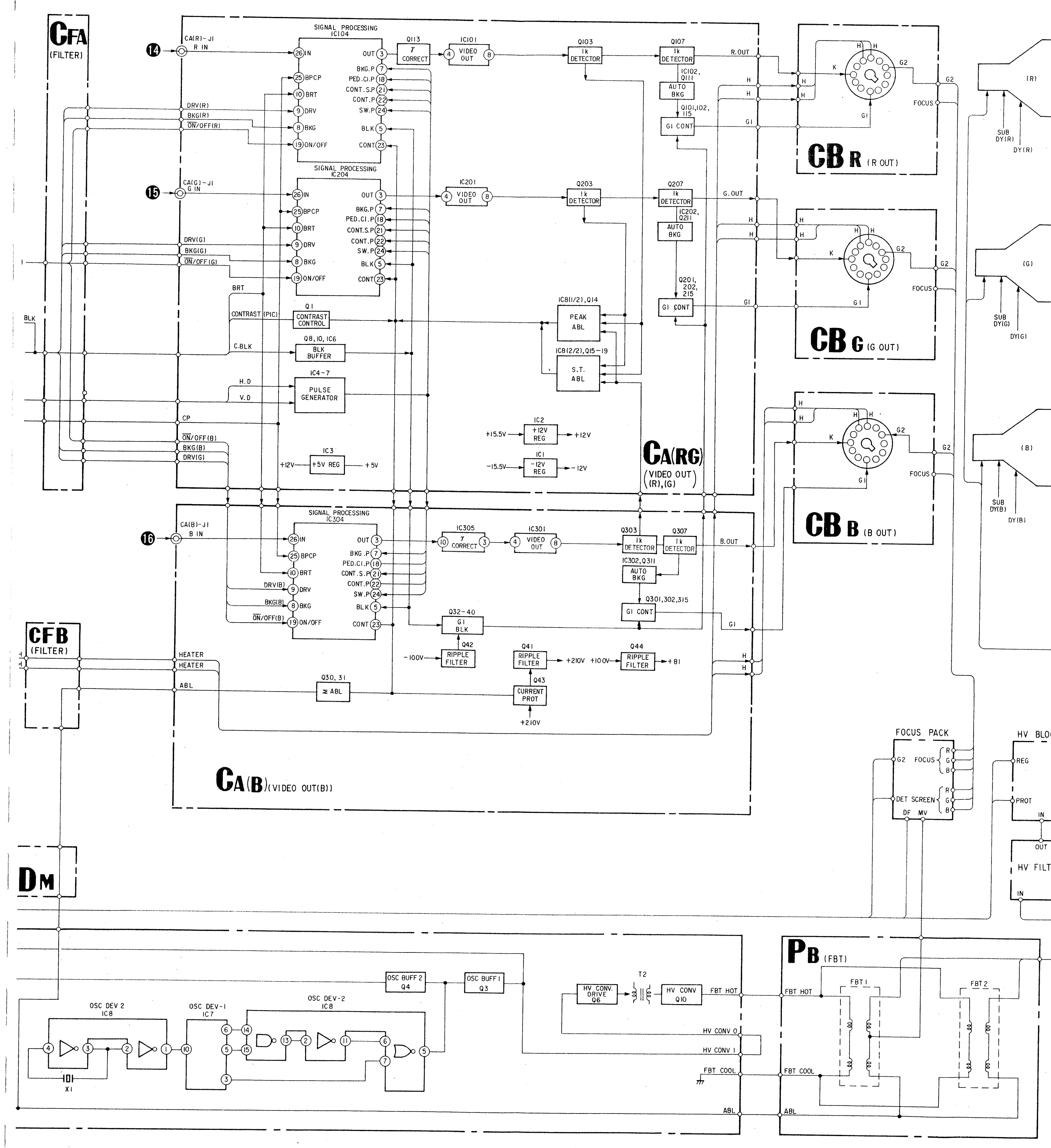

DISPLAY IC007
1 COM
2 COM
DM
KA (AUDIO)
AUDIO OUT(R)
Q502 BUFFER
AMP IC203
SPEAKER(+)
SPEAKER(−)
SPEAKER
Q501 REG
−15.5V
K (DYNAMIC FOCUS)
H.PARA, H SAW
V.PARA
AMP1 IC201(1/2)
AMP2 IC202
Q202 AMP 3
Q205,206 BUFFER2
T201
DF
AMP1 IC201(2/2)
Q203 AMP 2
Q204 BUFFER 1
Q201 FILTER
−35V
PA (HIGH VOLTAGE REG)
+12V
G2 REG Q18
G2
DEF
HV REC CONTROL IC6
TP3 HV DET
IC1
HV.REF
TP1 REG OSC
HV REG Q11
T1
HV REG DRIVE Q5
REG OSC BUFF Q20
COMP
OSC
POWER ON RESET Q12,14
HV.REG REF IC9
FAN PROT
STOP INV Q17
POWER CONT
POWER CONT Q15
H.SAW
H.STOP
V.STOP
H.PARA
V.PARA
STOP BUFF Q16
REG UP PROT IC3
HV PROT BUFF IC4
HV PROT IC2
HV PROT DET IC2
H.V PROT
HV STOP Q7
Σ1k DET2
Σ1k PROT BUFF IC4
Σ1k PROT IC3
LOW B PROT IC1
Σ1k PROT
HV. STOP Q8
Σ1k DET 1 Q1
TP2 INT OSC
INT. OSC
L254 +35V
L259 −35V
L255 +15.5V
L258 −15.5V
L256 +5.7V
L257 −5.7V
AMP IC252
2.5V REF IC251
RV251
AMP Q251
AMP Q258
POWER CONT
FAN PROT
CLAMP D284
−12V
−12V REG Q252
AMP Q259
SENSER
FAN
AMP Q260
CFA (FILTER)
CFB (FILTER)
HEATER
ABL
CA(R)-J1 R IN
SIGNAL PROCESSING IC104
BPCP
BRT
DRV
BKG
ON/OFF
OUT
BKG.P
PED.CL.P
CONT.S.P
CONT.P
SW.P
BLK
CONT
DRV(R)
BKG(R)
ON/OFF(R)
Q113 γ CORRECT
IC101 VIDEO OUT
Q103 Ik DETECTOR
Q107 Ik DETECTOR
IC102, Q111 AUTO BKG
Q101,102,115 G1 CONT
R.OUT
CA(G)-J1 G IN
SIGNAL PROCESSING IC204
DRV(G)
BKG(G)
ON/OFF(G)
IC201 VIDEO OUT
Q203 Ik DETECTOR
Q207 Ik DETECTOR
IC202, Q211 AUTO BKG
Q201,202,215 G1 CONT
G.OUT
BRT
CONTRAST (PIC)
Q1 CONTRAST CONTROL
C.BLK
Q8,10, IC6 BLK BUFFER
H.D
V.D
IC4-7 PULSE GENERATOR
CP
IC8(1/2),Q14 PEAK ABL
IC8(2/2),Q15-19 S.T. ABL
+15.5V IC2 +12V REG +12V
IC3 +5V REG +5V
−15.5V IC1 −12V REG −12V
ON/OFF(B)
BKG(B)
DRV(G)
CA(RG) (VIDEO OUT) (R),(G)
CA(B)-J1 B IN
SIGNAL PROCESSING IC304
IC305 γ CORRECT
IC301 VIDEO OUT
Q303 Ik DETECTOR
Q307 Ik DETECTOR
IC302,Q311 AUTO BKG
Q301,302,315 G1 CONT
B.OUT
Q32-40 G1 BLK
Q42 RIPPLE FILTER
−100V
Q41 RIPPLE FILTER
+210V
+100V
Q44 RIPPLE FILTER
+B1
Q30,31 Σ ABL
Q43 CURRENT PROT
+210V
CA(B) (VIDEO OUT(B))
CB R (R OUT)
CB G (G OUT)
CB B (B OUT)
G1
G2
K
H
FOCUS
SUB DY(R)
DY(R)
SUB DY(G)
DY(G)
SUB DY(B)
DY(B)
(R)
(G)
(B)
FOCUS PACK
G2 FOCUS
DET SCREEN
DF MV
HV BLOCK
REG
PROT
IN
OUT
HV FILTER
PB (FBT)
OSC BUFF 2 Q4
OSC BUFF 1 Q3
HV CONV DRIVE Q6
T2
HV CONV Q10
FBT HOT
HV CONV 0
HV CONV 1
FBT COOL
FBT 1
FBT 2
OSC DEV 2 IC8
OSC DEV-1 IC7
OSC DEV-2 IC8
X1
ABL
41
14
15
24
42
29
27
8
16
26
12
40
25
22
47
26


CFA (FILTER)
CA(R)-J1 R IN
SIGNAL PROCESSING IC104
Q113 γ CORRECT
IC101 VIDEO OUT
Q103 Ik DETECTOR
Q107 Ik DETECTOR
AUTO BKG
G1 CONT
R.OUT
CB R (R OUT)
CA(G)-J1 G IN
SIGNAL PROCESSING IC204
IC201 VIDEO OUT
Q203 Ik DETECTOR
Q207 Ik DETECTOR
G.OUT
CB G (G OUT)
Q1 CONTRAST CONTROL
Q8, 10, IC6 BLK BUFFER
IC4-7 PULSE GENERATOR
PEAK ABL
S.T. ABL
IC2 +12V REG
IC1 -12V REG
IC3 +5V REG
CA(RG) (VIDEO OUT) (R),(G)
CB B (B OUT)
CA(B)-J1 B IN
SIGNAL PROCESSING IC304
IC305 γ CORRECT
IC301 VIDEO OUT
Q303 Ik DETECTOR
Q307 Ik DETECTOR
B.OUT
Q32-40 G1 BLK
Q42 RIPPLE FILTER
Q41 RIPPLE FILTER
Q44 RIPPLE FILTER
Q43 CURRENT PROT
Q30, 31 ≅ ABL
CFB (FILTER)
HEATER
ABL
CA(B) (VIDEO OUT(B))
FOCUS PACK
HV BLOCK
HV FILTER
DM
OSC DEV 2 IC8
OSC DEV-1 IC7
OSC DEV-2 IC8
OSC BUFF 2 Q4
OSC BUFF 1 Q3
HV CONV. DRIVE Q6
T2
HV CONV Q10
FBT HOT
HV CONV O
HV CONV I
FBT COOL
PB (FBT)
FBT 1
FBT 2
X1
DY(R)
DY(G)
DY(B)
SUB DY(R)
SUB DY(G)
SUB DY(B)
(R)
(G)
(B)

7-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μ F unless otherwise noted. pF : μ μ F 50WV or less are not indicated except for electrolytics.
- All electrolytics are in 50V unless otherwise specified.
- All resistors are in ohms, 1/4W in resistance; 1/10W in chip resistance.
  k Ω =1000 Ω , M Ω =1000k Ω
- METAL FILM (:RN) resistors in 1%, 1/6W unless otherwise specified.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- △ : internal component.
- ▭ : panel designation and adjustment for repair.
- All variable and adjustable resistors have charactristic curve B, unless otherwise noted.

- The components identified by ⊠ in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
- When replacing components identified by ◪ , make the necessary adjustments indicated. If results do not meet the specified value, change the component identified by ⊠ and repeat the adjustment until the specified value is achieved.(Refer to R1, R4, R29, R30, R33, R34, R41, R42 adjust on Page 209～212.)

Part replaced (◪)	Adjustment (⊠)
IC2, Q7, D9, D12, C13, R20, R21, R22, R23, R24, R32, R33, R34, R35, R36, R82, (PA BOARD) PA MOUNT HV BLOCK	HV HOLD DOWN (R33, R34)
IC1, IC6, IC7, IC8, IC9, D13, C16, R37, R38, R39, R40, R41, R42, R53, R55, R56, R58, R59, R129, X1, (PA BOARD) R733 (DA BOARD) PA MOUNT, PB MOUNT HV BLOCK	HV REGULATION (R41, R42)
IC2, IC3, IC5, Q1, Q2, Q7, Q8, D4, D5, D9, R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R20, R21, R22, R23, R24, R43, R44, R45, R46, R47,R82, R88, R119, R120, R121, R122, (PA BOARD) R733 (DA BOARD) PA MOUNT, PB MOUNT	BEAM CURRENT PROTECTOR (R1, R4)
IC1, IC3, IC5, Q8, D4, D5, D10, D11, R9, R10, R26, R28, R29, R30, R31, R88, R95 (PA BOARD) PA MOUNT	LOW B PROTECTOR (R29, R30)

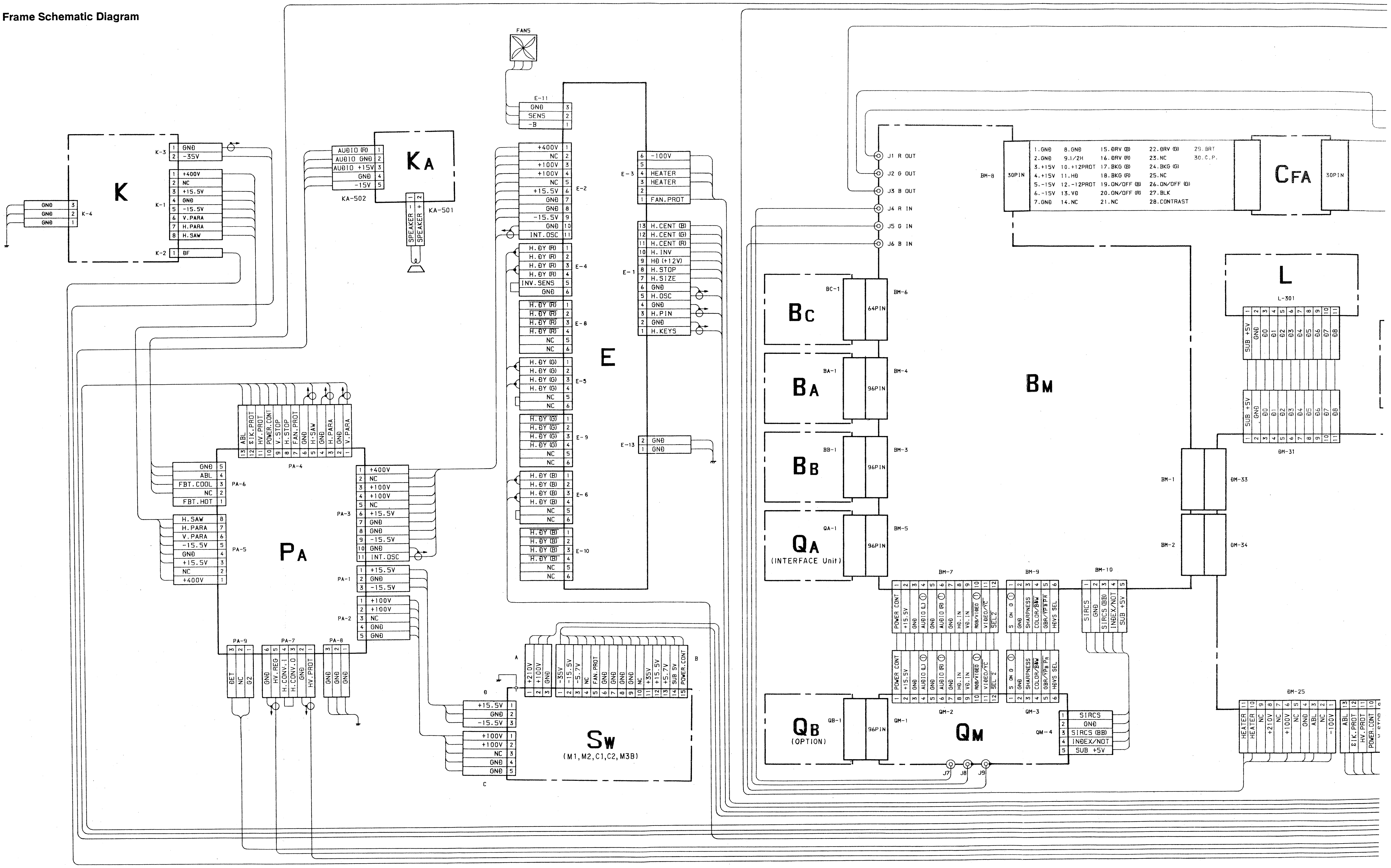
- Voltage value is the reference value between it & the earth, when NTSC 3.58 color bar signal is received from color bar generator (digital multi- meter used : 10M ohms／V DC).
- ☆ : Displays a list of BB, BA board modes.
  (PAL, SECAM, NTSC 3.58, NTSC 4.43, S-VIDEO)
  Displays a list of existing voltages, when board E has issued a white pattern of internal signals.
- Unit of voltage values is V (volt).
- ✳ : Measurement disabled
- ▭ : B+ line
- ▭ : B− line
  (Actual measured value may be different).
- Round numerals indicate Waveform Table No.

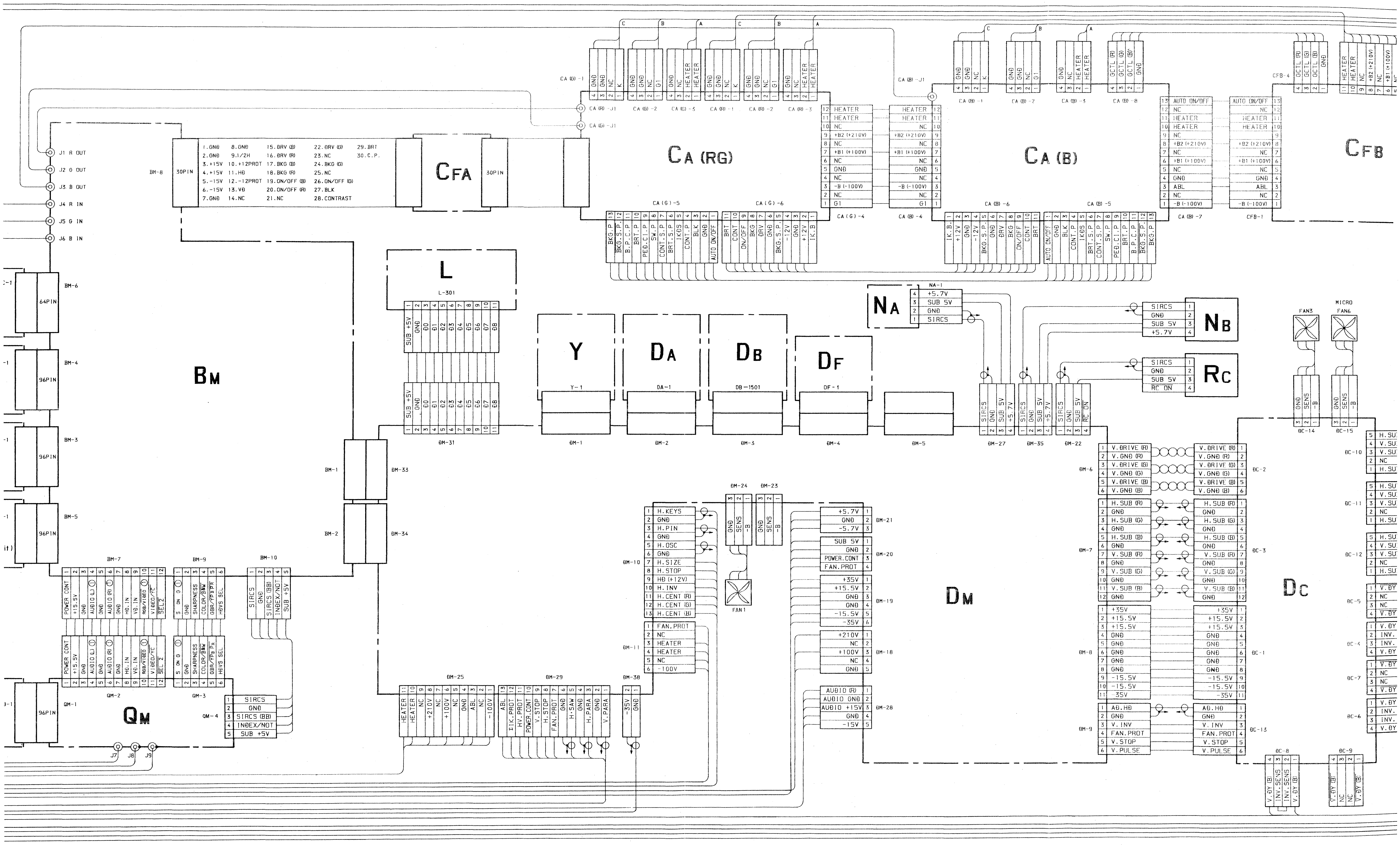
Reference information

RESISTOR	:	RN	METAL FILM
	:	RC	SOLID
	:	FPRD	NONFLAMMABLE CARBON
	:	FUSE	NONFLAMMABLE FUSIBLE
	:	RS	NONFLAMMABLE METAL OXIDE
	:	RB	NONFLAMMABLE CEMENT
	:	RW	NONFLAMMABLE WIREWOUND
	:	※	ADJUSTMENT RESISTOR
COIL	:	LF-8L	MICRO INDUCTOR
CAPACITOR	:	TA	TANTALUM
	:	PS	STYROL
	:	PP	POLYPROPYLENE
	:	PT	MYLAR
	:	MPS	METALIZED POLYESTER
	:	MPP	METALIZED POLYPROPYLENE
	:	ALB	BIPOLAR
	:	ALT	HIGH TEMPERATURE
	:	ALR	HIGH RIPPLE

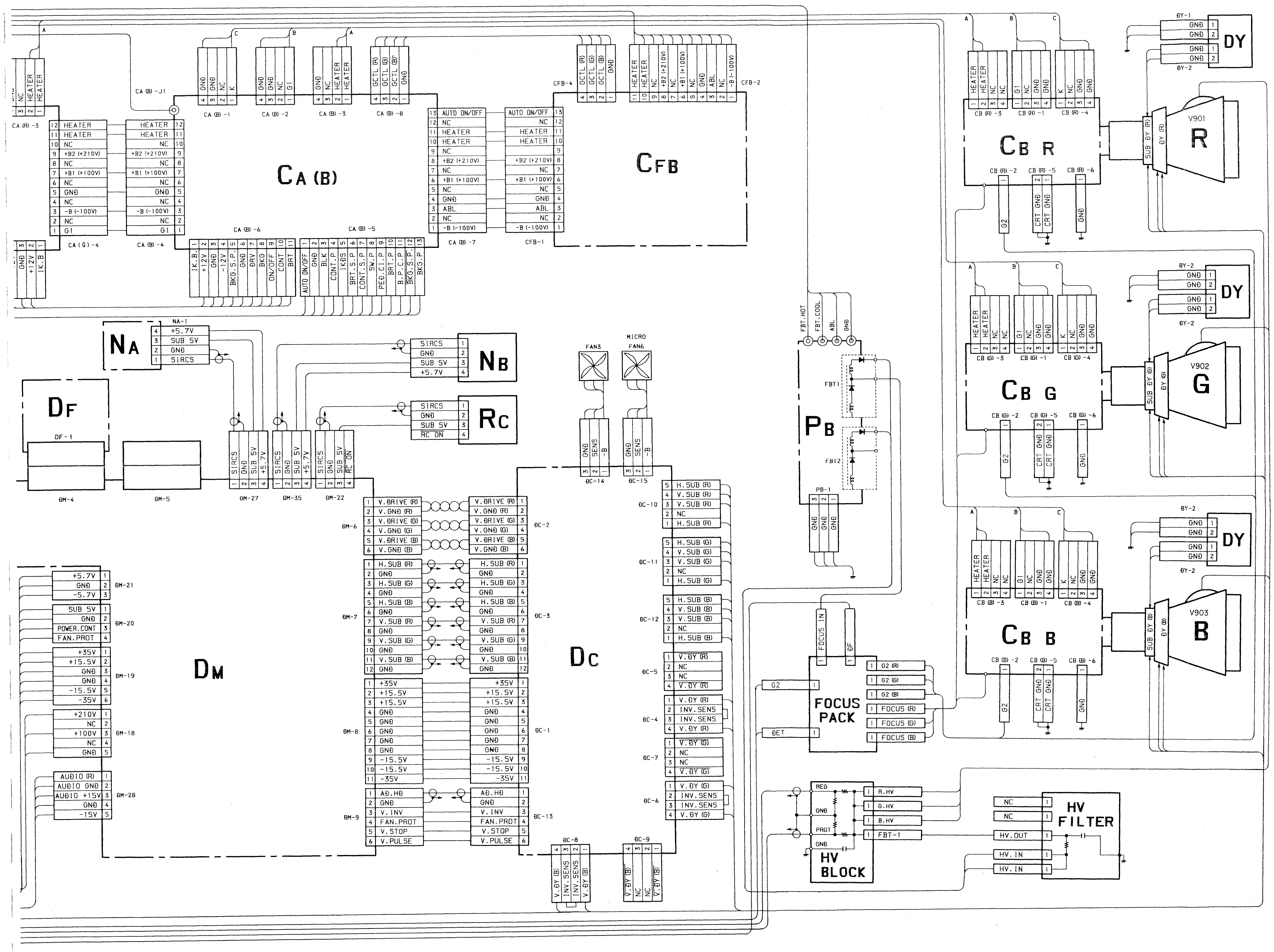
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

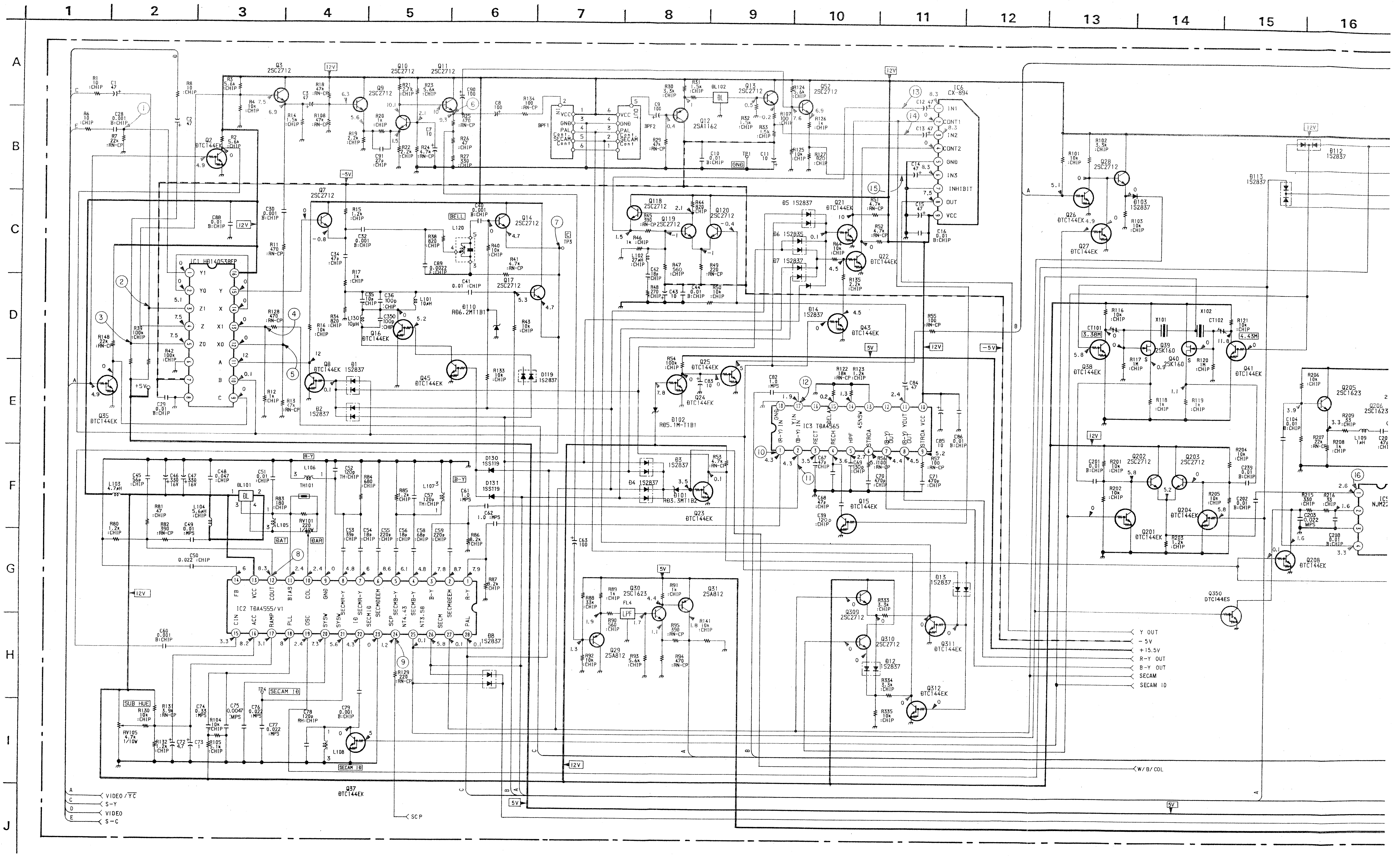
Frame Schematic Diagram

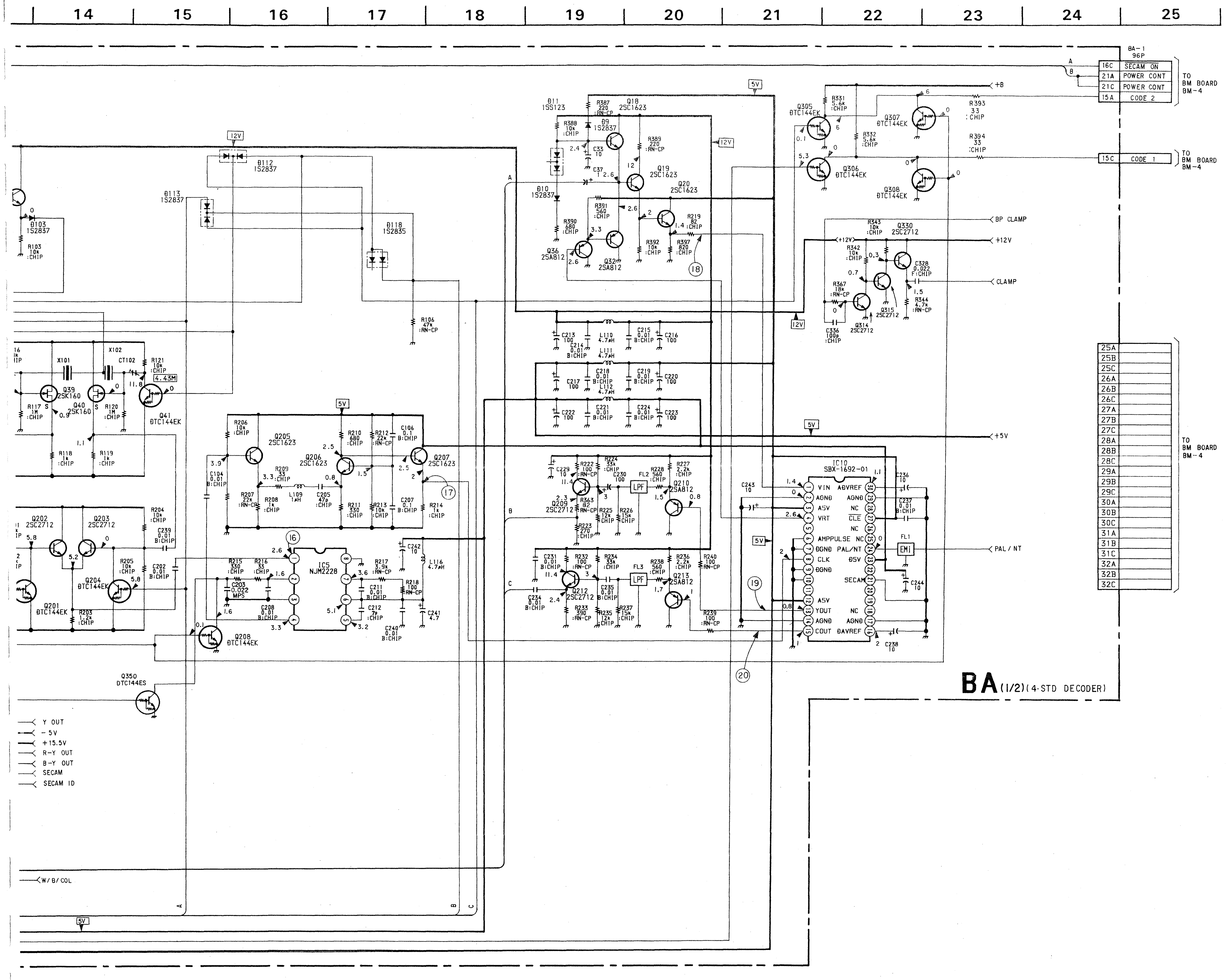

K
K-3
1 GND
2 -35V
K-1
1 +400V
2 NC
3 +15.5V
4 GND
5 -15.5V
6 V.PARA
7 H.PARA
8 H.SAW
K-2
1 BF
K-4
3 GND
2 GND
1 GND
KA
KA-502
1 AUDIO (R)
2 AUDIO GND
3 AUDIO +15V
4 GND
5 -15V
KA-501
1 SPEAKER -
2 SPEAKER +
FANS
E-11
3 GND
2 SENS
1 -B
E
E-2
1 +400V
2 NC
3 +100V
4 +100V
5 NC
6 +15.5V
7 GND
8 GND
9 -15.5V
10 GND
11 INT.OSC
E-4
1 H.DY (R)
2 H.DY (R)
3 H.DY (R)
4 H.DY (R)
5 INV.SENS
6 GND
E-8
1 H.DY (R)
2 H.DY (R)
3 H.DY (R)
4 H.DY (R)
5 NC
6 NC
E-5
1 H.DY (G)
2 H.DY (G)
3 H.DY (G)
4 H.DY (G)
5 NC
6 NC
E-9
1 H.DY (G)
2 H.DY (G)
3 H.DY (G)
4 H.DY (G)
5 NC
6 NC
E-6
1 H.DY (B)
2 H.DY (B)
3 H.DY (B)
4 H.DY (B)
5 NC
6 NC
E-10
1 H.DY (B)
2 H.DY (B)
3 H.DY (B)
4 H.DY (B)
5 NC
6 NC
E-3
6 -100V
5
4 HEATER
3 HEATER
2
1 FAN.PROT
E-1
13 H.CENT (B)
12 H.CENT (G)
11 H.CENT (R)
10 H.INV
9 HD (+12V)
8 H.STOP
7 H.SIZE
6 GND
5 H.OSC
4 GND
3 H.PIN
2 GND
1 H.KEYS
E-13
2 GND
1 GND
PA
PA-4
13 ABL
12 ΣIK.PROT
11 HV.PROT
10 POWER.CONT
9 V.STOP
8 H.STOP
7 FAN.PROT
6 GND
5 H.SAW
4 GND
3 H.PARA
2 GND
1 V.PARA
PA-6
5 GND
4 ABL
3 FBT.COOL
2 NC
1 FBT.HOT
PA-5
8 H.SAW
7 H.PARA
6 V.PARA
5 -15.5V
4 GND
3 +15.5V
2 NC
1 +400V
PA-3
1 +400V
2 NC
3 +100V
4 +100V
5 NC
6 +15.5V
7 GND
8 GND
9 -15.5V
10 GND
11 INT.OSC
PA-1
1 +15.5V
2 GND
3 -15.5V
PA-2
1 +100V
2 +100V
3 NC
4 GND
5 GND
PA-9
3 DET
2 NC
1 G2
PA-7
6 GND
5 HV.REG
4 H.CONV.I
3 H.CONV.O
2
1 HV.PROT
PA-8
3 GND
2 GND
1 GND
Sw
(M1, M2, C1, C2, M3B)
A
1 +210V
2 +100V
3 GND
B
1 -35V
2 -15.5V
3 -5.7V
4 NC
5 FAN.PROT
6 GND
7 GND
8 GND
9 GND
10 NC
11 +35V
12 +15.5V
13 +5.7V
14 SUB 5V
15 POWER.CONT
D
1 +15.5V
2 GND
3 -15.5V
C
1 +100V
2 +100V
3 NC
4 GND
5 GND
J1 R OUT
J2 G OUT
J3 B OUT
J4 R IN
J5 G IN
J6 B IN
BM-8
30PIN
1.GND
2.GND
3.+15V
4.+15V
5.-15V
6.-15V
7.GND
8.GND
9.1/2H
10.+12PROT
11.HD
12.-12PROT
13.VD
14.NC
15.DRV (B)
16.DRV (R)
17.BKG (B)
18.BKG (R)
19.ON/OFF (B)
20.ON/OFF (R)
21.NC
22.DRV (G)
23.NC
24.BKG (G)
25.NC
26.ON/OFF (G)
27.BLK
28.CONTRAST
29.BRT
30.C.P.
CFA
30PIN
L
L-301
1 SUB +5V
2 GND
3 D0
4 D1
5 D2
6 D3
7 D4
8 D5
9 D6
10 D7
11 D8
BM-31
1 SUB +5V
2 GND
3 D0
4 D1
5 D2
6 D3
7 D4
8 D5
9 D6
10 D7
11 D8
BC
BC-1
64PIN
BM-6
BA
BA-1
96PIN
BM-4
BB
BB-1
96PIN
BM-3
QA
(INTERFACE Unit)
QA-1
96PIN
BM-5
BM
BM-1
BM-33
BM-2
BM-34
BM-7
1 POWER CONT
2 +15.5V
3 GND
4 AUDIO (L) ①
5 GND
6 AUDIO (R) ①
7 GND
8 HD.IN
9 VD.IN
10 RGB/VIDEO ①
11 VIDEO/YC SEL2
12
BM-9
1 S ON ①
2 GND
3 SHARPNESS
4 COLOR/BW
5 GBR/YPBPR
6 HDVS SEL
BM-10
1 SIRCS
2 GND
3 SIRCS (BB)
4 INDEX/NOT
5 SUB +5V
QM-2
1 POWER CONT
2 +15.5V
3 GND
4 AUDIO (L) ①
5 GND
6 AUDIO (R) ①
7 GND
8 HD.IN
9 VD.IN
10 RGB/VIDEO ①
11 VIDEO/YC SEL 2
12
QM-3
1 S ON ①
2 GND
3 SHARPNESS
4 COLOR/BW
5 GBR/YPB PR
6 HDVS SEL
QM-4
1 SIRCS
2 GND
3 SIRCS (BB)
4 INDEX/NOT
5 SUB +5V
QB
(OPTION)
QB-1
96PIN
QM-1
QM
J7
J8
J9
BM-25
11 HEATER
10 HEATER
9 NC
8 +210V
7 NC
6 +100V
5 NC
4 GND
3 ABL
2 NC
1 -100V
13 ABL
12 ΣIK.PROT
11 HV.PROT
10 POWER.CONT
9 V.STOP



CFA
CA (RG)
CA (B)
CFB
BM
L
Y
DA
DB
DF
NA
NB
RC
DM
DC
QM
J1 R OUT
J2 G OUT
J3 B OUT
J4 R IN
J5 G IN
J6 B IN
J7
J8
J9
BM-8
30PIN
1.GND
2.GND
3.+15V
4.+15V
5.-15V
6.-15V
7.GND
8.GND
9.1/2H
10.+12PROT
11.HD
12.-12PROT
13.VD
14.NC
15.DRV (B)
16.DRV (R)
17.BKG (B)
18.BKG (R)
19.ON/OFF (B)
20.ON/OFF (R)
21.NC
22.DRV (G)
23.NC
24.BKG (G)
25.NC
26.ON/OFF (G)
27.BLK
28.CONTRAST
29.BRT
30.C.P.
BM-6
64PIN
BM-4
96PIN
BM-3
BM-5
BM-1
BM-2
BM-33
BM-34
BM-7
BM-9
BM-10
POWER CONT
+15.5V
GND
AUDIO (L)
AUDIO (R)
HD.IN
VD.IN
RGB/VIDEO
VIDEO/YC
SEL2
SHARPNESS
COLOR/B&W
GBR/YPBPR
HDVS SEL
SIRCS
SIRCS (BB)
INDEX/NOT
SUB +5V
QM-1
QM-2
QM-3
QM-4
L-301
SUB +5V
D0
D1
D2
D3
D4
D5
D6
D7
D8
DM-31
Y-1
DA-1
DB-1501
DF-1
DM-1
DM-2
DM-3
DM-4
DM-5
NA-1
+5.7V
SUB 5V
SIRCS
SUB 5V
RC ON
DM-27
DM-35
DM-22
FAN3
MICRO
FAN6
SENS
-B
DC-14
DC-15
CA (G)-1
CA (R)-J1
CA (G)-J1
CA (G)-2
CA (G)-3
CA (R)-1
CA (R)-2
CA (R)-3
CA (G)-5
CA (G)-6
CA (G)-4
CA (B)-J1
CA (B)-1
CA (B)-2
CA (B)-3
CA (B)-8
CA (B)-4
CA (B)-6
CA (B)-5
CA (B)-7
CFB-4
CFB-1
HEATER
NC
K
G1
+B2 (+210V)
+B1 (+100V)
-B (-100V)
AUTO ON/OFF
ABL
GCTL (R)
GCTL (G)
GCTL (B)
BKG.P
BKG.S.P
B.P.C.P
BRT.CT.P
PED.C1.P
SW.P
CONT.S.P
BRT.S.P
IKDS
CONT
BLK
BRT
ON/OFF
DRV
BKG
-12V
+12V
IK.B
DM-24
DM-23
FAN1
DM-10
H.KEYS
H.PIN
H.OSC
H.SIZE
H.STOP
HD (+12V)
H.INV
H.CENT (R)
H.CENT (G)
H.CENT (B)
DM-11
FAN.PROT
-100V
DM-21
-5.7V
DM-20
POWER.CONT
DM-19
+35V
+15.5V
-15.5V
-35V
DM-18
+210V
+100V
DM-28
AUDIO (R)
AUDIO GND
AUDIO +15V
-15V
DM-25
DM-29
DM-38
ABL
PIK.PROT
HV.PROT
POWER.CONT
V.STOP
FAN.PROT
H.SAW
H.PARA
V.PARA
-35V
DM-6
V.DRIVE (R)
V.GND (R)
V.DRIVE (G)
V.GND (G)
V.DRIVE (B)
V.GND (B)
DC-2
DM-7
H.SUB (R)
H.SUB (G)
H.SUB (B)
V.SUB (R)
V.SUB (G)
V.SUB (B)
DC-3
DM-8
DC-1
DM-9
AD.HD
V.INV
V.PULSE
DC-13
DC-10
DC-11
DC-12
DC-5
DC-4
DC-7
DC-6
DC-8
DC-9
V.DY
INV.SENS
V.DY (B)
H.SU
V.SU
INV.


CA (B)
CFB
CB R
CB G
CB B
NA
NB
RC
DF
DM
DC
PB
FOCUS PACK
HV BLOCK
HV FILTER
DY
V901
R
V902
G
V903
B
FAN3
MICRO FAN6
FBT1
FBT2
CA (B) -J1
CA (B) -1
CA (B) -2
CA (B) -3
CA (B) -8
CA (B) -4
CA (B) -5
CA (B) -6
CA (B) -7
CA (G) -4
CA (R) -3
CFB-1
CFB-2
CFB-4
CB (R) -1
CB (R) -2
CB (R) -3
CB (R) -4
CB (R) -5
CB (R) -6
CB (G) -1
CB (G) -2
CB (G) -3
CB (G) -4
CB (G) -5
CB (G) -6
CB (B) -1
CB (B) -2
CB (B) -3
CB (B) -4
CB (B) -5
CB (B) -6
DY-1
DY-2
NA-1
DF-1
DM-4
DM-5
DM-6
DM-7
DM-8
DM-9
DM-18
DM-19
DM-20
DM-21
DM-22
DM-27
DM-28
DM-35
DC-1
DC-2
DC-3
DC-4
DC-5
DC-6
DC-7
DC-8
DC-9
DC-10
DC-11
DC-12
DC-13
DC-14
DC-15
PB-1
HEATER
GND
NC
K
G1
GCTL (R)
GCTL (G)
GCTL (B)
AUTO ON/OFF
+B2 (+210V)
+B1 (+100V)
ABL
-B (-100V)
+12V
-12V
IK.B
BKG.S.P
DRV
BKG
ON/OFF
CONT
BRT
BLK
IKDS
CONT.S.P
SW.P
PED.CI.P
BRT.P
B.P.C.P
BKG.S.P
+5.7V
SUB 5V
SIRCS
RC ON
SENS
-B
V.DRIVE (R)
V.GND (R)
V.DRIVE (G)
V.GND (G)
V.DRIVE (B)
V.GND (B)
H.SUB (R)
H.SUB (G)
H.SUB (B)
V.SUB (R)
V.SUB (G)
V.SUB (B)
+35V
+15.5V
-15.5V
-35V
AD.HD
V.INV
FAN.PROT
V.STOP
V.PULSE
-5.7V
POWER.CONT
+210V
+100V
AUDIO (R)
AUDIO GND
AUDIO +15V
-15V
V.DY (R)
V.DY (G)
V.DY (B)
INV.SENS
SUB DY (R)
DY (R)
SUB DY (G)
DY (G)
SUB DY (B)
DY (B)
G2
CRT GND
FBT.HOT
FBT.COOL
FOCUS IN
DF
DET
G2 (R)
G2 (G)
G2 (B)
FOCUS (R)
FOCUS (G)
FOCUS (B)
REG
PROT
R.HV
G.HV
B.HV
FBT-1
HV.OUT
HV.IN
A
B
C


IC1 HD14053BFP
IC2 TDA4555/V1
IC3 TDA4565
IC6 CX-894
BL101
BL102
BPF1
BPF2
FL4
LPF
X101
X102
CT101 3.38M
CT102 4.43M
TH101
RV101
RV105
BELL
SUB HUE
SECAM ID
BAT
BAR
B-Y
R-Y
12V
-5V
5V
VIDEO/YC
S-Y
VIDEO
S-C
SCP
Y OUT
-5V
+15.5V
R-Y OUT
B-Y OUT
SECAM
SECAM ID
W/B/COL
Q37 DTC144EK
Q3 2SC2712
Q9 2SC2712
Q10 2SC2712
Q11 2SC2712
Q12 2SA1162
Q13 2SC2712
Q52 2SC2712
Q2 DTC144EK
Q35 DTC144EK
Q7 2SC2712
Q14 2SC2712
Q16 DTC144EK
Q17 2SC2712
Q45 DTC144EK
Q8 DTC144EK
Q118 2SC2712
Q119 2SC2712
Q120 2SC2712
Q21 DTC144EK
Q22 DTC144EK
Q43 DTC144EK
Q24 DTC144EK
Q25 DTC144EK
Q23 DTC144EK
Q15 DTC144EK
Q26 DTC144EK
Q27 DTC144EK
Q28 2SC2712
Q38 DTC144EK
Q39 2SK160
Q40 2SK160
Q41 DTC144EK
Q201 DTC144EK
Q202 2SC2712
Q203 2SC2712
Q204 DTC144EK
Q205 2SC1623
Q206 2SC1623
Q208 DTC144EK
Q350 DTC144ES
Q29 2SA812
Q30 2SC1623
Q31 2SA812
Q309 2SC2712
Q310 2SC2712
Q311 DTC144EK
Q312 DTC144EK
D110 RD6.2MT1B1
D119 1S2837
D1 1S2837
D2 1S2837
D3 1S2837
D4 1S2837
D5 1S2837
D6 1S2835
D7 1S2837
D8 1S2837
D12 1S2837
D13 1S2837
D14 1S2837
D101 HD3.3MT1B2
D102 RD5.1M-T1B1
D103 1S2837
D112 1S2837
D113 1S2837
D130 1SS119
D131 1SS119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BA-1 96P
16C SECAM ON
21A POWER CONT
21C POWER CONT
15A CODE 2
TO BM BOARD BM-4
15C CODE 1
TO BM BOARD BM-4
25A
25B
25C
26A
26B
26C
27A
27B
27C
28A
28B
28C
29A
29B
29C
30A
30B
30C
31A
31B
31C
32A
32B
32C
TO BM BOARD BM-4
+B
BP CLAMP
+12V
CLAMP
+5V
PAL / NT
IC10 SBX-1692-01
IC5 NJM2228
Q205 2SC1623
Q206 2SC1623
Q207 2SC1623
Q208 DTC144EK
Q209 2SC2712
Q210 2SA812
Q212 2SC2712
Q213 2SA812
Q201 DTC144EK
Q202 2SC2712
Q203 2SC2712
Q204 DTC144EK
Q350 DTC144ES
Q39 2SK160
Q40 2SK160
Q41 DTC144EK
Q305 DTC144EK
Q306 DTC144EK
Q307 DTC144EK
Q308 DTC144EK
Q314 2SC2712
Q315 2SC2712
Q330 2SC2712
Q18 2SC1623
Q19 2SC1623
Q20 2SC1623
Q32 2SA812
Q36 2SA812
X101
X102
4.43M
LPF
FL1
FL2
FL3
EMI
Y OUT
- 5V
+15.5V
R-Y OUT
B-Y OUT
SECAM
SECAM ID
W/B/COL
5V
12V
A
B
C
⑯
⑰
⑱
⑲
⑳

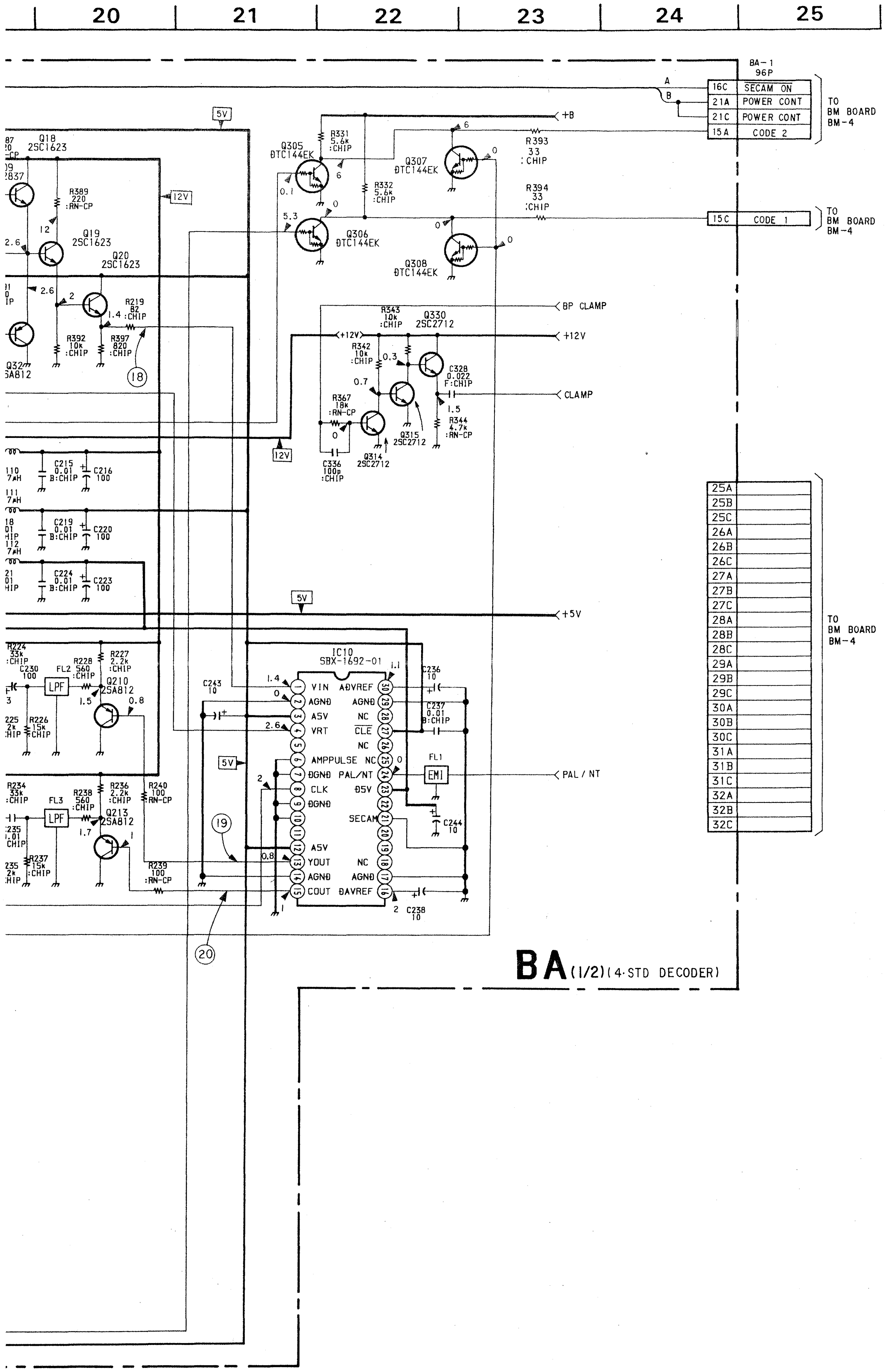
BA(1/2)(4-STD DECODER)

BA (1/2)	IC1	HD14053BFP	SYSTEM SW-1	202	2SC2712	CLK BUFF-3
	2	TDA4555/V1	DECODER	203	2SC2712	CLK BUFF-4
	3	TDA4565	TRANSIENT	204	DTC144EK	PAL CLK SW
	5	NJM2228M	CLK GEN	205	2SC1623	CLK AMP-1
	6	CX-894	VIDEO AMP	206	2SC1623	CLK AMP-2
	10	SBX1692-01	COMB FILTER	207	2SC1623	CLK AMP-3
				208	DTC144EK	GEN SW
	Q2	DTC144EK	MODE SW-1	209	2SC2712	NT/PAL Y BUFF-2
	3	2SC2712	VIDEO BUFF-1	210	2SA812	NT/PAL Y BUFF-1
	7	2SC2712	C BUFF	212	2SC1712	NT/PAL C BUFF-2
	8	DTC144EK	MODE SW-1	213	2SA812	NT/PAL C BUFF-1
	9	2SC2712	VIDEO AMP-1	305	DTC144EK	CODE 2 SW-1
	10	2SC2712	VIDEO AMP-2	306	DTC144EK	CODE 1 SW-1
	11	2SC2712	VIDEO AMP-3	307	DTC144EK	CODE SW-2
	12	2SA1162	Y BUFF-1	308	DTC144EK	CODE SW-2
	13	2SC2712	Y BUFF-2	309	2SC2712	NT3.58 SW
	14	2SC2712	SECAM C BUFF	310	2SC2712	NT4.43 SW
	15	DTC144EK	MODE SW-10	311	DTC144EK	TRAP SW
	16	DTC144EK	C FILTER SW	312	DTC144EK	TRAP SW
	17	2SC2712	NT/PAL C BUFF	314	2SC2712	CLAMP BUFF-1
	18	2SC1623	CLAMP-4	315	2SC2712	CLAMP BUFF-2
	19	2SC1623	CLAMP-6	330	2SC2712	CLAMP BUFF-3
	20	2SC1623	NT/PAL VIDEO BUFF	350	DTC144ES	GEN SW
	21	DTC144EK	Y MODE SW-6			
	22	DTC144EK	Y MODE SW-7	D1	1S2837	SYSTEM DET-1
	23	DTC144EK	B/W SW-4	2	1S2837	SYSTEM DET-2
	24	DTC144EK	POWER CONT-1	3	1S2837	B/W SW-1
	25	DTC144EK	POWER CONT-2	4	1S2837	B/W SW-2
	26	DTC144EK	SECAM SW-1	5	1S2837	Y MODE SW-1
	27	DTC144EK	SECAM SW-2	6	1S2835	Y MODE SW-2
	28	2SC2712	SECAM SW-3	7	1S2837	Y MODE SW-3
	29	2SA812	NT/PAL VIDEO	8	1S2837	MODE SW-3
	30	2SC1623	NT/PAL VIDEO AMP-1	9	1S2837	CLAMP-3
	31	2SA812	NT/PAL VIDEO AMP-2	10	1S2837	CLAMP-2
	32	2SA812	CLAMP-5	11	1SS123	CLAMP-1
	35	DTC144EK	MODE SW-2	12	1S2837	NT3.58 DET
	36	2SA812	CLAMP	13	1S2837	MODE SW-11
	37	DTC144EK	ID	14	1S2837	Y MODE SW-4
	38	DTC144EK	NT OSC SW	101	RD3.3M-B2	B/W SW-3
	39	2SK160	NT CLK BUFF-1	102	RD5.1M-B2	POWER CONT
	40	2SK160	PAL CLK BUFF-2	103	1S2837	SECAM SW-4
	41	DTC144EK	PAL OSC SW	110	RD6.2M-B1	SECAM SW
	43	DTC144EK	Y MODE SW-5	112	1S2837	MODE SW-4
	45	DTC144EK	C FILTER SW	113	1S2837	MODE SW-5
	52	2SC2712	VIDEO BUFF-2	118	1S2835	MODE SW-6
	118	2SC2712	NT/PAL Y AMP-3	119	1S2837	C FILTER SW
	119	2SC2712	NT/PAL Y AMP-1	130	1SS119	C FILTER SW
	120	2SC2712	NT/PAL Y AMP-2	131	1SS119	C FILTER SW
	201	DTC144EK	NT CLK SW			

BA BOARD (1/2)

REF	Pin No.	NTSC 3.58	PAL	SECAM	NTSC 4.43
IC1	②	0	0	− 0.7	− 0.7
	⑪	12	12	0	0
	⑫	0	0	− 0.7	− 0.7
	⑭	0	0	− 0.7	− 0.7
	⑮	0	0	− 0.7	− 0.7
IC2	⑤	6.1	5.8	4.2	7.6
	⑦	6	5.5	4.2	7.3
	⑲	2.4	2.4	5.6	2.4
	⑳	7.5	5.7	5.7	7.5
	㉑	5.6	7.7	6.8	5.6
	㉕	0.1	0.1	0.1	5.8
	㉖	5.8	0.1	0.1	0.1
	㉗	0.1	0.1	5.8	0.1
	㉘	0.1	5.8	0.1	0.1
IC6	②	10	0	0	10
	④	0	10	10	0
IC10	㉔	0	3.6	3.6	0

REF		NTSC 3.58	PAL	SECAM	NTSC 4.43	REF		NTSC 3.58	PAL	SECAM
Q7	B	0	0	− 0.8	− 0.8	Q202	B	5.8	0	5.8
	C	−	−	−	−		C	−	−	−
	E	− 0.8	− 0.8	− 1.4	− 1.4		E	5.2	5.1	5.2
Q8	B	0.1	0.1	5.3	5.3	Q203	B	0	5.8	5.8
	C	12	12	0	0		C	−	−	−
	E	−	−	−	−		E	5.2	5.1	5.2
Q16	B	5.2	0.2	0.2	5.2	Q204	B	5.8	0	0
	C	0	3.5	1.5	0		C	0	5.8	5.8
	E	−	−	−	−		E	−	−	−
Q17	B	5.3	5.3	0.2	5.3	Q305	B	0.1	5.8	0.1
	C	4.7	4.7	5	4.7		C	6	0	6
	E	−	−	−	−		E	−	−	−
Q21	B	0.1	0.1	5.3	5.3	Q306	B	5.3	0.1	0.1
	C	0	0	0	0		C	0	6	6
	E	−	−	−	−		E	−	−	−
Q22	B	4.5	4.5	0.5	0.5	Q307	B	0	0	0
	C	0	0	10	10		C	6	0	6
	E	−	−	−	−		E	−	−	−
Q27	B	4.9	0	0	4.9	Q308	B	0	0	0
	C	0	0	0	0		C	0	6	6
	E	−	−	−	−		E	−	−	−
Q37	B	5	0	0	5	Q309	B	0	0	5.7
	C	0	0	0	0		C	−	−	−
	E	−	−	−	−		E	0	0	5.1
Q38	B	5.7	0	0	0	Q310	B	0	5.1	0
	C	0	11.7	11.7	11.7		C	−	−	−
	E	−	−	−	−		E	0	4.5	1.4
Q41	B	0	5.9	0	5.1	Q311	B	0	0.5	0.2
	C	11.8	0	11.8	0		C	0	0	3.8
	E	−	−	−	−		E	−	−	−
Q43	B	0	0	0	0	Q312	B	0	0.5	0.2
	C	4.5	4.5	0.5	0.5		C	0	2.8	3.2
	E	−	−	−	−		E	−	−	−
Q201	B	0	5.2	0	5.2					
	C	5.8	0	5.8	0					
	E	−	−	−	−					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25
BA-1 96P
16C SECAM ON
21A POWER CONT
21C POWER CONT
15A CODE 2
TO BM BOARD BM-4
15C CODE 1
TO BM BOARD BM-4
TO BM BOARD BM-4
25A
25B
25C
26A
26B
26C
27A
27B
27C
28A
28B
28C
29A
29B
29C
30A
30B
30C
31A
31B
31C
32A
32B
32C
+B
BP CLAMP
+12V
CLAMP
+5V
PAL / NT
5V
12V
Q18 2SC1623
Q19 2SC1623
Q20 2SC1623
Q32 2SA812
R389 220 :RN-CP
R392 10k :CHIP
R397 820 :CHIP
R219 82 :CHIP
Q305 DTC144EK
Q306 DTC144EK
Q307 DTC144EK
Q308 DTC144EK
R331 5.6k :CHIP
R332 5.6k :CHIP
R393 33 :CHIP
R394 33 :CHIP
R343 10k :CHIP
Q330 2SC2712
R342 10k :CHIP
C328 0.022 F:CHIP
R367 18k :RN-CP
R344 4.7k :RN-CP
C336 100p :CHIP
Q314 2SC2712
Q315 2SC2712
C215 0.01 B:CHIP
C216 100
C219 0.01 B:CHIP
C220 100
C224 0.01 B:CHIP
C223 100
R224 33k :CHIP
C230 100
FL2 LPF
R228 560 :CHIP
R227 2.2k :CHIP
Q210 2SA812
R225 2k :CHIP
R226 15k :CHIP
R234 33k :CHIP
FL3 LPF
R238 560 :CHIP
R236 2.2k :CHIP
R240 100 :RN-CP
Q213 2SA812
C235 0.01 :CHIP
R235 2k :CHIP
R237 15k :CHIP
R239 100 :RN-CP
C243 10
IC10 SBX-1692-01
VIN
AGND
A5V
VRT
AMPPULSE
DGND
CLK
YOUT
COUT
ADVREF
NC
CLE
PAL/NT
D5V
SECAM
DAVREF
C236 10
C237 0.01 B:CHIP
FL1 EMI
C244 10
C238 10
⑱
⑲
⑳

BA (1/2) (4-STD DECODER)

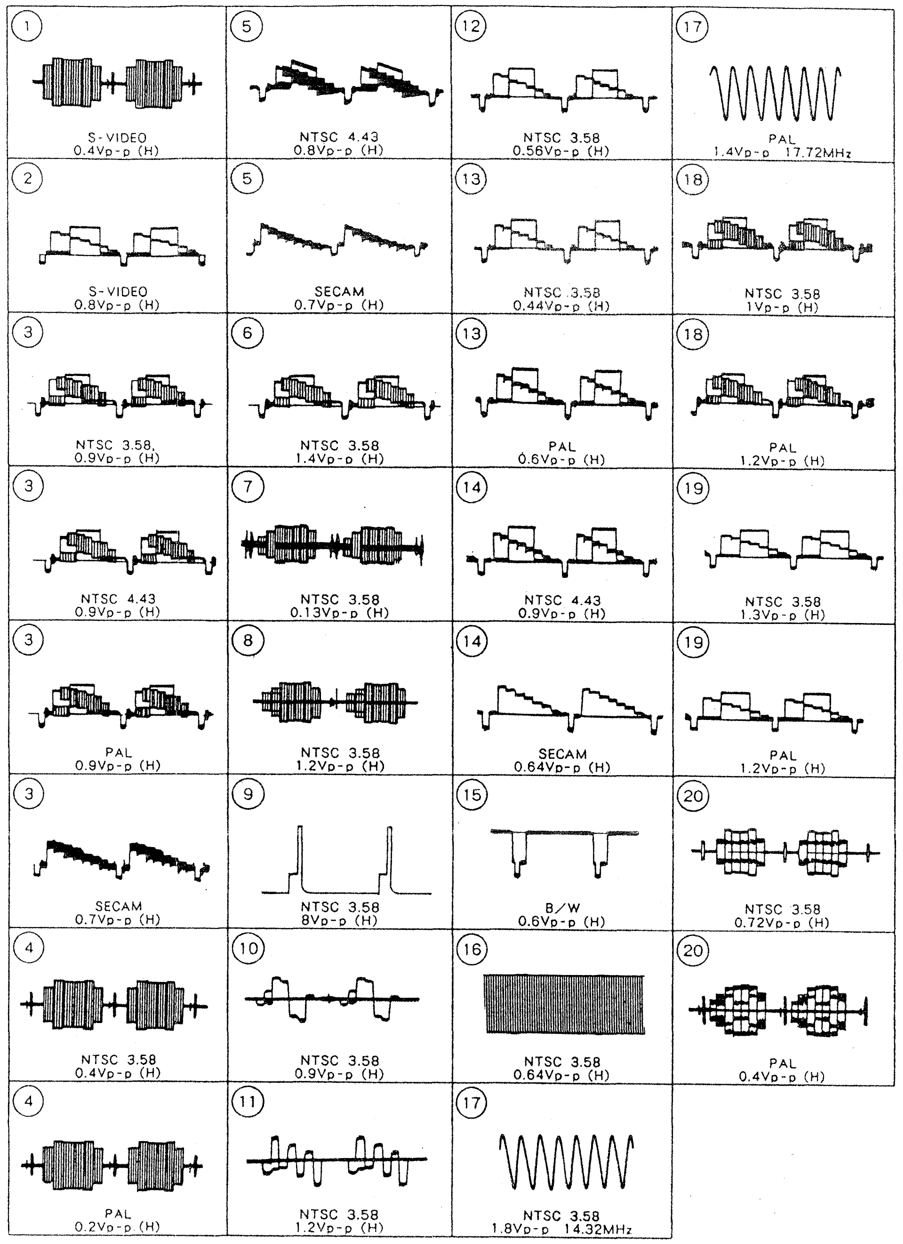
BA (1/2)	IC1	HD14053BFP	SYSTEM SW-1	202	2SC2712	CLK BUFF-3
	2	TDA4555/V1	DECODER	203	2SC2712	CLK BUFF-4
	3	TDA4565	TRANSIENT	204	DTC144EK	PAL CLK SW
	5	NJM2228M	CLK GEN	205	2SC1623	CLK AMP-1
	6	CX-894	VIDEO AMP	206	2SC1623	CLK AMP-2
	10	SBX1692-01	COMB FILTER	207	2SC1623	CLK AMP-3
				208	DTC144EK	GEN SW
	Q2	DTC144EK	MODE SW-1	209	2SC2712	NT/PAL Y BUFF-2
	3	2SC2712	VIDEO BUFF-1	210	2SA812	NT/PAL Y BUFF-1
	7	2SC2712	C BUFF	212	2SC1712	NT/PAL C BUFF-2
	8	DTC144EK	MODE SW-1	213	2SA812	NT/PAL C BUFF-1
	9	2SC2712	VIDEO AMP-1	305	DTC144EK	CODE 2 SW-1
	10	2SC2712	VIDEO AMP-2	306	DTC144EK	CODE 1 SW-1
	11	2SC2712	VIDEO AMP-3	307	DTC144EK	CODE SW-2
	12	2SA1162	Y BUFF-1	308	DTC144EK	CODE SW-2
	13	2SC2712	Y BUFF-2	309	2SC2712	NT3.58 SW
	14	2SC2712	SECAM C BUFF	310	2SC2712	NT4.43 SW
	15	DTC144EK	MODE SW-10	311	DTC144EK	TRAP SW
	16	DTC144EK	C FILTER SW	312	DTC144EK	TRAP SW
	17	2SC2712	NT/PAL C BUFF	314	2SC2712	CLAMP BUFF-1
	18	2SC1623	CLAMP-4	315	2SC2712	CLAMP BUFF-2
	19	2SC1623	CLAMP-6	330	2SC2712	CLAMP BUFF-3
	20	2SC1623	NT/PAL VIDEO BUFF	350	DTC144ES	GEN SW
	21	DTC144EK	Y MODE SW-6			
	22	DTC144EK	Y MODE SW-7	D1	1S2837	SYSTEM DET-1
	23	DTC144EK	B/W SW-4	2	1S2837	SYSTEM DET-2
	24	DTC144EK	POWER CONT-1	3	1S2837	B/W SW-1
	25	DTC144EK	POWER CONT-2	4	1S2837	B/W SW-2
	26	DTC144EK	SECAM SW-1	5	1S2837	Y MODE SW-1
	27	DTC144EK	SECAM SW-2	6	1S2835	Y MODE SW-2
	28	2SC2712	SECAM SW-3	7	1S2837	Y MODE SW-3
	29	2SA812	NT/PAL VIDEO	8	1S2837	MODE SW-3
	30	2SC1623	NT/PAL VIDEO AMP-1	9	1S2837	CLAMP-3
	31	2SA812	NT/PAL VIDEO AMP-2	10	1S2837	CLAMP-2
	32	2SA812	CLAMP-5	11	1SS123	CLAMP-1
	35	DTC144EK	MODE SW-2	12	1S2837	NT3.58 DET
	36	2SA812	CLAMP	13	1S2837	MODE SW-11
	37	DTC144EK	ID	14	1S2837	Y MODE SW-4
	38	DTC144EK	NT OSC SW	101	RD3.3M-B2	B/W SW-3
	39	2SK160	NT CLK BUFF-1	102	RD5.1M-B2	POWER CONT
	40	2SK160	PAL CLK BUFF-2	103	1S2837	SECAM SW-4
	41	DTC144EK	PAL OSC SW	110	RD6.2M-B1	SECAM SW
	43	DTC144EK	Y MODE SW-5	112	1S2837	MODE SW-4
	45	DTC144EK	C FILTER SW	113	1S2837	MODE SW-5
	52	2SC2712	VIDEO BUFF-2	118	1S2835	MODE SW-6
	118	2SC2712	NT/PAL Y AMP-3	119	1S2837	C FILTER SW
	119	2SC2712	NT/PAL Y AMP-1	130	1SS119	C FILTER SW
	120	2SC2712	NT/PAL Y AMP-2	131	1SS119	C FILTER SW
	201	DTC144EK	NT CLK SW			

BA BOARD (1/2)

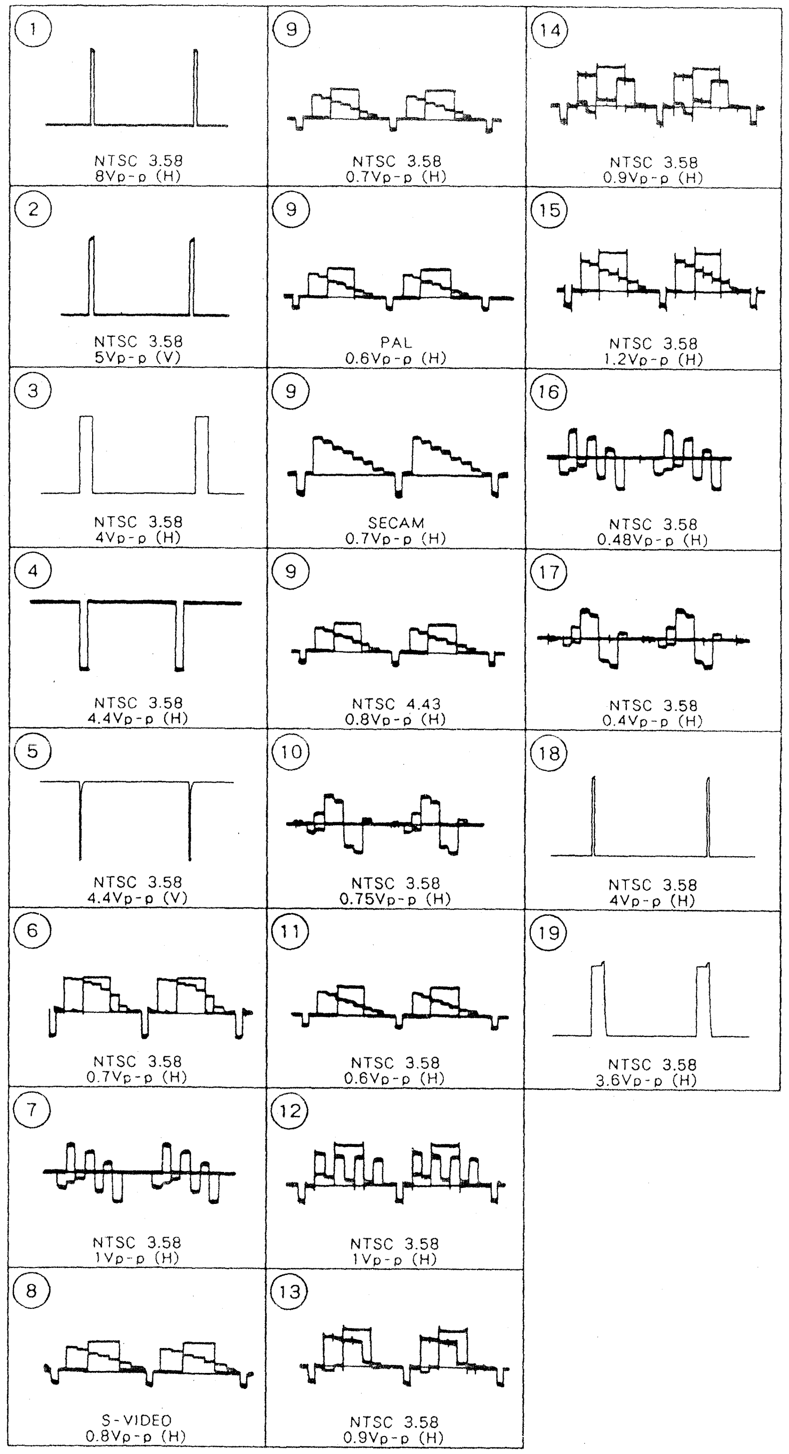
REF	Pin No.	NTSC 3.58	PAL	SECAM	NTSC 4.43
IC1	②	0	0	− 0.7	− 0.7
	⑪	12	12	0	0
	⑫	0	0	− 0.7	− 0.7
	⑭	0	0	− 0.7	− 0.7
	⑮	0	0	− 0.7	− 0.7
IC2	⑤	6.1	5.8	4.2	7.6
	⑦	6	5.5	4.2	7.3
	⑲	2.4	2.4	5.6	2.4
	⑳	7.5	5.7	5.7	7.5
	㉑	5.6	7.7	6.8	5.6
	㉕	0.1	0.1	0.1	5.8
	㉖	5.8	0.1	0.1	0.1
	㉗	0.1	0.1	5.8	0.1
	㉘	0.1	5.8	0.1	0.1
IC6	②	10	0	0	10
	④	0	10	10	0
IC10	㉔	0	3.6	3.6	0

REF		NTSC 3.58	PAL	SECAM	NTSC 4.43	REF		NTSC 3.58	PAL	SECAM	NTSC 4.43
Q7	B	0	0	− 0.8	− 0.8	Q202	B	5.8	0	5.8	0
	C	−	−	−	−		C	−	−	−	−
	E	− 0.8	− 0.8	− 1.4	− 1.4		E	5.2	5.1	5.2	5.1
Q8	B	0.1	0.1	5.3	5.3	Q203	B	0	5.8	5.8	5.8
	C	12	12	0	0		C	−	−	−	−
	E	−	−	−	−		E	5.2	5.1	5.2	5.1
Q16	B	5.2	0.2	0.2	5.2	Q204	B	5.8	0	0	0
	C	0	3.5	1.5	0		C	0	5.8	5.8	5.8
	E	−	−	−	−		E	−	−	−	−
Q17	B	5.3	5.3	0.2	5.3	Q305	B	0.1	5.8	0.1	0.1
	C	4.7	4.7	5	4.7		C	6	0	6	6
	E	−	−	−	−		E	−	−	−	−
Q21	B	0.1	0.1	5.3	5.3	Q306	B	5.3	0.1	0.1	5.3
	C	0	0	0	0		C	0	6	6	0
	E	−	−	−	−		E	−	−	−	−
Q22	B	4.5	4.5	0.5	0.5	Q307	B	0	0	0	0
	C	0	0	10	10		C	6	0	6	6
	E	−	−	−	−		E	−	−	−	−
Q27	B	4.9	0	0	4.9	Q308	B	0	0	0	0
	C	0	0	0	0		C	0	6	6	6
	E	−	−	−	−		E	−	−	−	−
Q37	B	5	0	0	5	Q309	B	0	0	5.7	0
	C	0	0	0	0		C	−	−	−	−
	E	−	−	−	−		E	0	0	5.1	0
Q38	B	5.7	0	0	0	Q310	B	0	5.1	0	5.1
	C	0	11.7	11.7	11.7		C	−	−	−	−
	E	−	−	−	−		E	0	4.5	1.4	4.5
Q41	B	0	5.9	0	5.1	Q311	B	0	0.5	0.2	0.5
	C	11.8	0	11.8	0		C	0	0	3.8	2.8
	E	−	−	−	−		E	−	−	−	−
Q43	B	0	0	0	0	Q312	B	0	0.5	0.2	0.5
	C	4.5	4.5	0.5	0.5		C	0	2.8	3.2	2.8
	E	−	−	−	−		E	−	−	−	−
Q201	B	0	5.2	0	5.2						
	C	5.8	0	5.8	0						
	E	−	−	−	−						

BA BAORD (1/2)



BA BAORD (2/2)

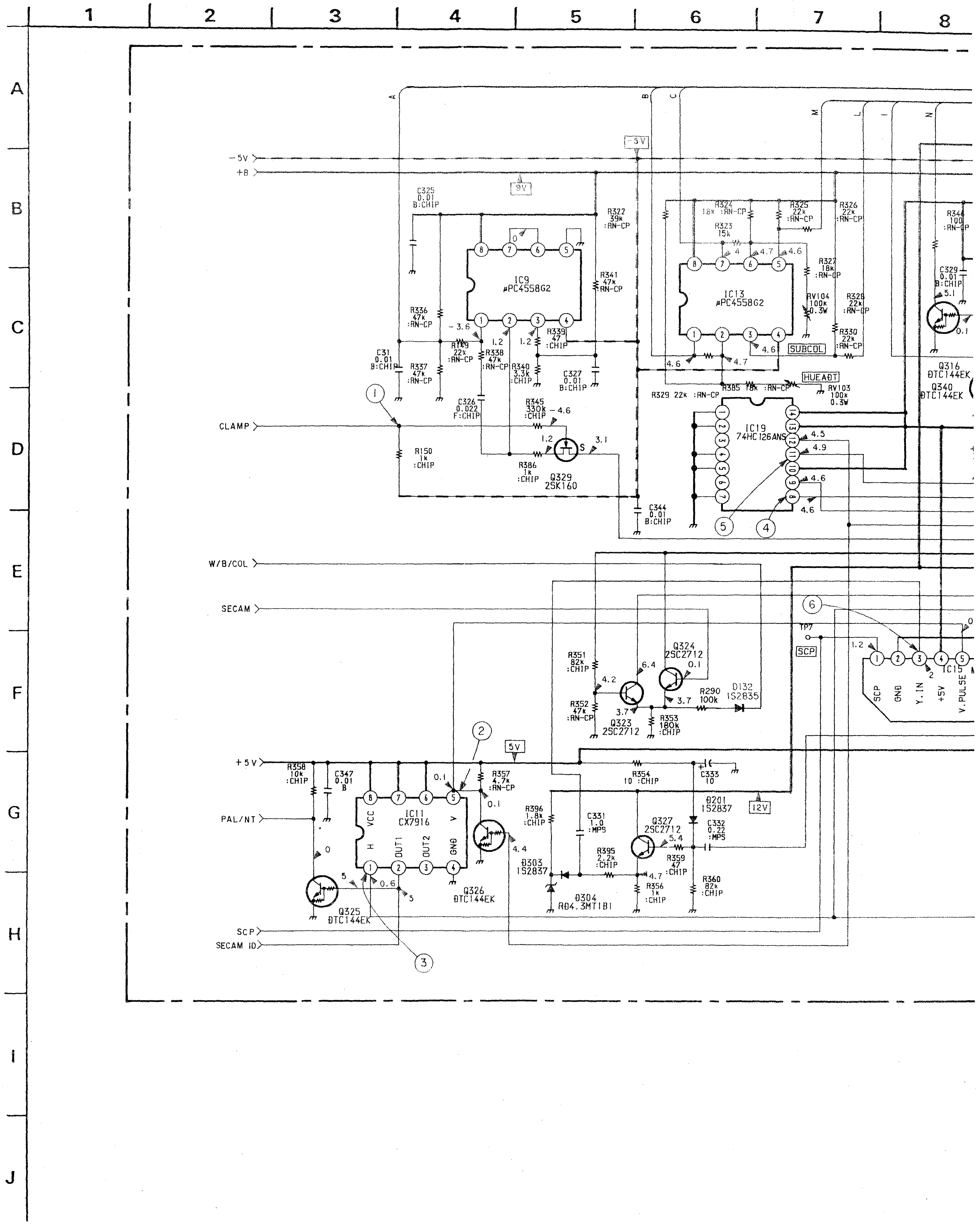


BA (2/2)	IC7	HD14053BFP	SYSTEM SW-2
	8	CXA1216P	MATRIX
	9	μPC4558G2	BRT CONT-2
	11	CX-7916	50/60 DET
	12	SNY-9202	SHARPNESS
	13	μPC4558G2	LEVEL SHIFT-1
	14	SN74LS12NS	MODE DET
	15	H8B7178B	JUNGLE
	16	LM7812CT	12V REG
	17	PQ05RF1	5V REG
	19	SN74HC126ANS	SYNC BUFF
	Q33	2SC2712	R-Y BUFF-1
	34	2SC2712	B-Y BUFF-1
	48	2SC2712	R-Y AMP-1
	49	2SC2712	R-Y AMP-2
	50	2SC2712	B-Y AMP-1
	51	2SC2712	B-Y AMP-2
	152	DTC144EK	SYSTEM MODE SW-2
	301	2SD774	9V REG
	302	2SC2712	BLK BUFF-1
	303	2SC2712	B-Y BUFF-2
	304	2SC2712	R-Y BUFF-2
	313	2SC2712	Y AMP-3
	317	2SC2712	Y AMP-2
	318	2SC2712	Y AMP
	319	DTC144EK	MODE SW-7
	320	DTC144EK	MODE SW-8
	321	DTC144EK	MODE SW-9
	323	2SC2712	REF DC BUFF
	324	2SC2712	BGP SHIFT
	325	DTC144EK	50/60 SW
	326	DTC144EK	V SYNC SW
	327	2SC2712	Y CLAMP-2
	329	2SK160	BRT CONT-1
	336	2SC2712	Y AMP-6
	337	2SA812	Y AMP-5
	338	2SC2712	Y AMP-4
	340	DTC144EK	MODE DET
	D107	1S2837	BLK ADD-2
	108	V06C	+12V PROT
	109	V06C	+5V PROT
	117	1S2837	BLK ADD-1
	132	1S2835	
	201	1S2837	Y CLAMP-1
	301	1S2837	LEVEL SHIFT-2
	303	1S2837	Y LEVEL ADJ-2
	304	RD4.3M-B1	Y LEVEL ADJ-1

BA BOARD (2/2)

REF	Pin No.	NTSC 3.58	PAL	SECAM	NTSC 4.43
IC11	②	5	0	0	5

REF		NTSC 3.58	PAL	SECAM	NTSC 4.43
Q325	B	5	0	0	5
	C	0	3.6	3.6	0
	E	–	–	–	–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A
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C
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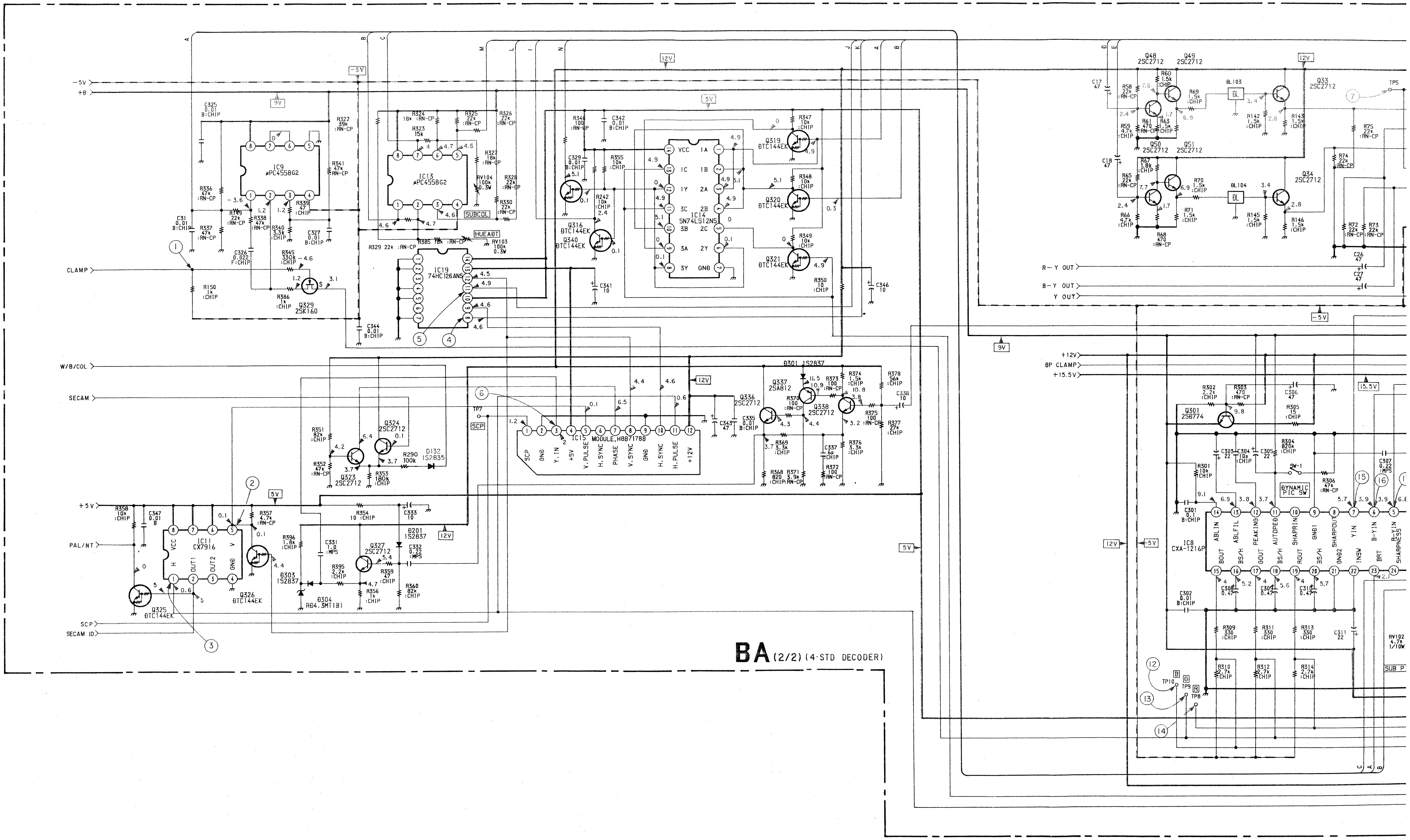
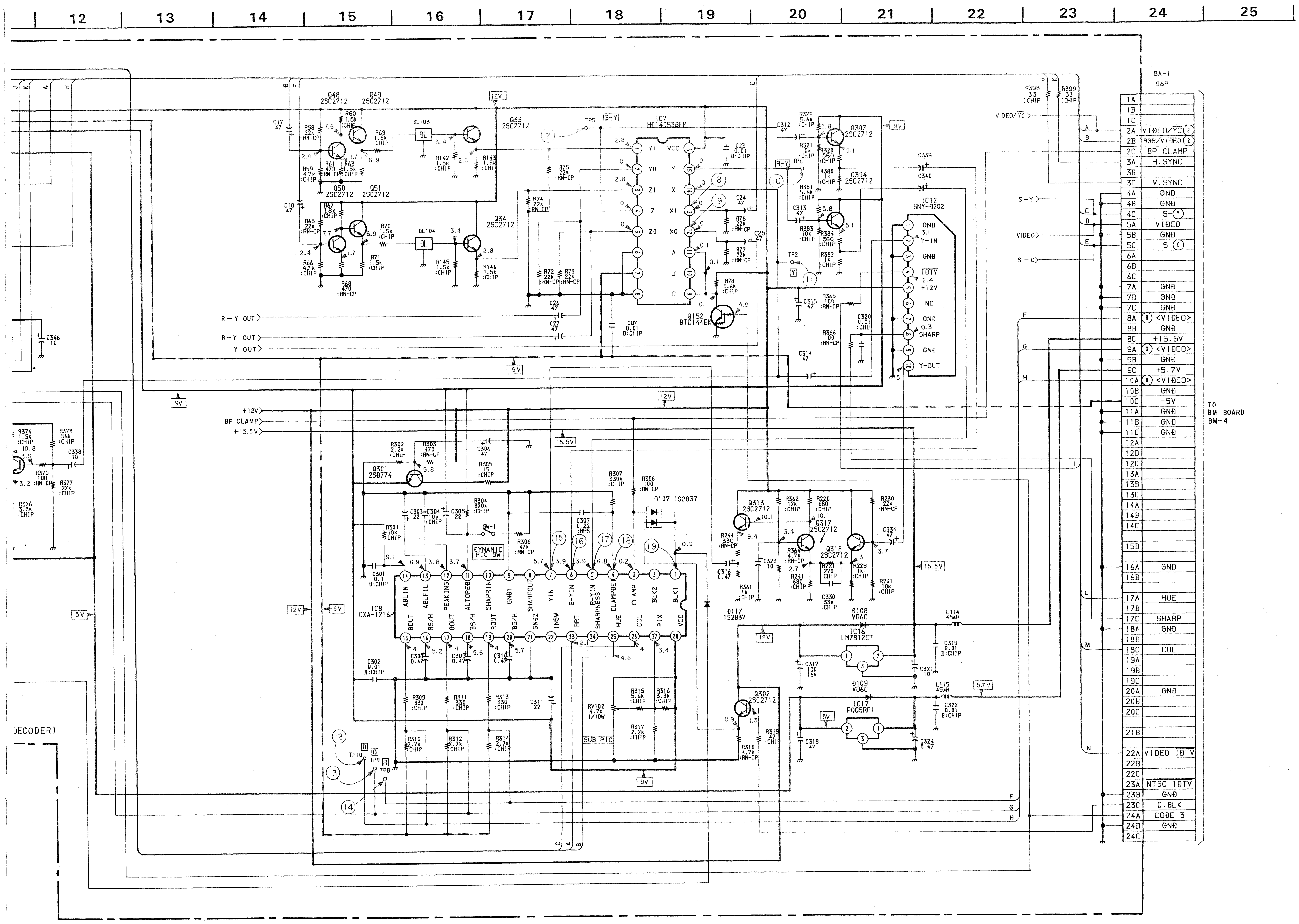
E
F
G
H
I
J
-5V
+B
CLAMP
W/B/COL
SECAM
+5V
PAL/NT
SCP
SECAM ID
IC9
μPC4558G2
IC13
μPC4558G2
IC19
74HC126ANS
IC11
CX7916
IC15
Q329
2SK160
Q323
2SC2712
Q324
2SC2712
Q325
DTC144EK
Q326
DTC144EK
Q327
2SC2712
Q316
DTC144EK
Q340
DTC144EK
D132
1S2835
D303
1S2837
D304
RD4.3MT1B1
D201
1S2837
RV104
RV103
SUBCOL
HUEADJ
TP7
SCP
9V
5V
12V
SCP
GND
Y.IN
+5V
V.PULSE


-5V
+B
CLAMP
W/B/COL
SECAM
+5V
PAL/NT
SCP
SECAM ID
IC9 μPC4558G2
IC13 μPC4558G2
IC19 74HC126ANS
IC14 SN74LS12NS
IC15 MODULE,H8B7178B
IC11 CX7916
IC8 CXA-1216P
Q329 2SK160
Q316 DTC144EK
Q340 DTC144EK
Q319 DTC144EK
Q320 DTC144EK
Q321 DTC144EK
Q323 2SC2712
Q324 2SC2712
Q325 DTC144EK
Q326 DTC144EK
Q327 2SC2712
Q336 2SC2712
Q337 2SA812
Q338 2SC2712
Q301 2SB774
Q48 2SC2712
Q49 2SC2712
Q50 2SC2712
Q51 2SC2712
Q33 2SC2712
Q34 2SC2712
D132 1S2835
D201 1S2837
D301 1S2837
D303 1S2837
D304 RD4.3MT1B1
DL103
DL104
SUBCOL
HUEADT
RV103
RV104
RV102
DYNAMIC PIC SW
SW-1
TP5
TP7
TP8
TP9
TP10
R-Y OUT
B-Y OUT
Y OUT
+12V
BP CLAMP
+15.5V
12V
9V
5V
-5V
15.5V
SUB P

BA (2/2) (4·STD DECODER)


12
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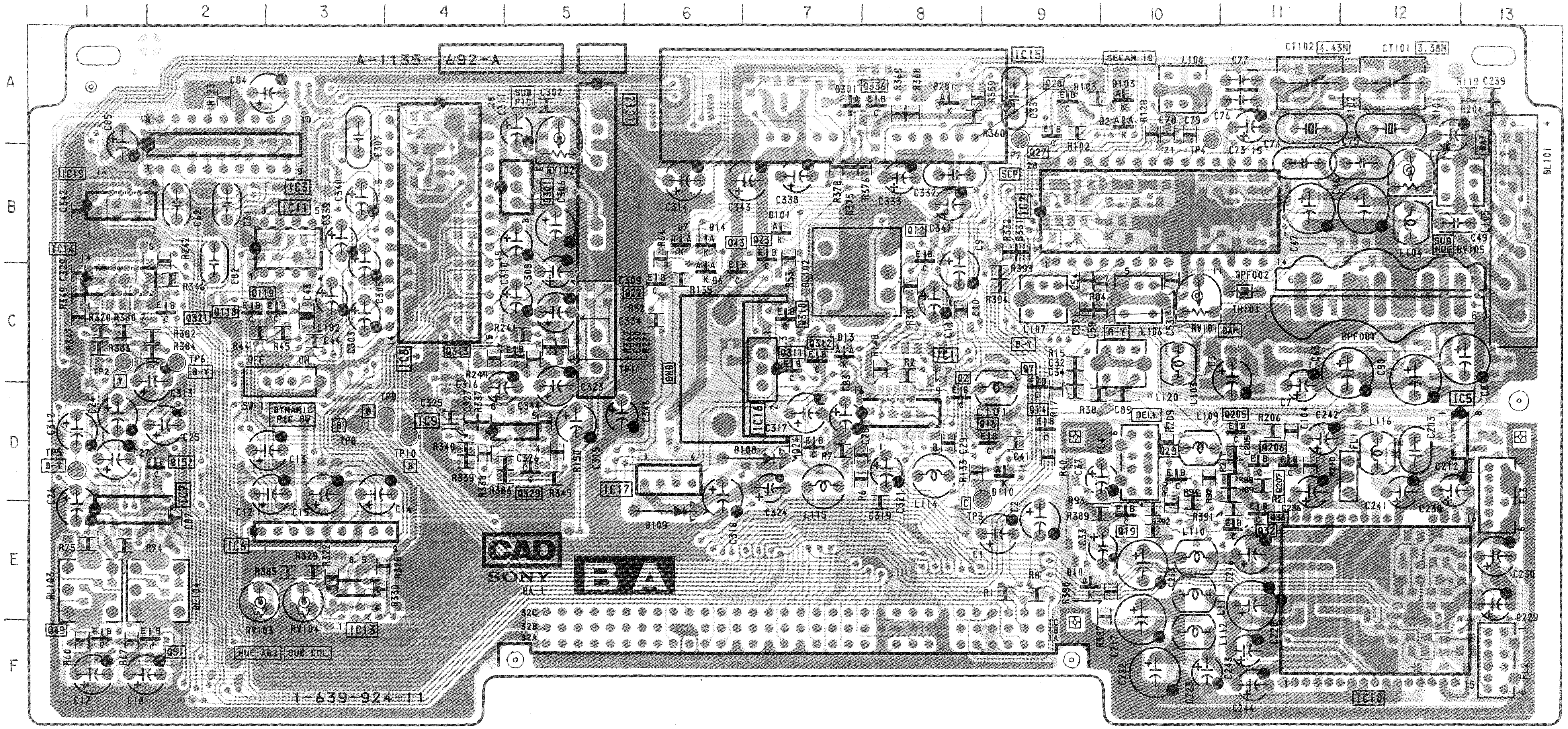
25
IC7 HD14053BFP
IC8 CXA-1216P
IC12 SNY-9202
IC16 LM7812CT
IC17 PQ05RF1
Q48 2SC2712
Q49 2SC2712
Q50 2SC2712
Q51 2SC2712
Q33 2SC2712
Q34 2SC2712
Q303 2SC2712
Q304 2SC2712
Q313 2SC2712
Q317 2SC2712
Q318 2SC2712
Q302 2SC2712
Q301 2SB774
Q152 DTC144EK
D107 1S2837
D117 1S2837
D108 V06C
D109 V06C
DL103
DL104
RV102 4.7k 1/10W
SUB PIC
DYNAMIC PIC SW
SW-1
TP5 B-Y
TP6 R-Y
TP2 Y
TP10 B
TP9 G
TP8 R
R-Y OUT
B-Y OUT
Y OUT
+12V
BP CLAMP
+15.5V
VIDEO/YC
S-Y
VIDEO
S-C
(DECODER)
BA-1 96P
1A
1B
1C
2A VIDEO/YC
2B RGB/VIDEO
2C BP CLAMP
3A H.SYNC
3B
3C V.SYNC
4A GND
4B GND
4C S-Y
5A VIDEO
5B GND
5C S-C
6A
6B
6C
7A GND
7B GND
7C GND
8A <VIDEO>
8B GND
8C +15.5V
9A <VIDEO>
9B GND
9C +5.7V
10A <VIDEO>
10B GND
10C -5V
11A GND
11B GND
11C GND
12A
12B
12C
13A
13B
13C
14A
14B
14C
15B
16A GND
16B
17A HUE
17B
17C SHARP
18A GND
18B
18C COL
19A
19B
19C
20A GND
20B
20C
21B
22A VIDEO IDTV
22B
22C
23A NTSC IDTV
23B GND
23C C.BLK
24A CODE 3
24B GND
24C
TO BM BOARD BM-4

BA [4-STD DECODER]

- BA BAORD -

-COMPONENT SIDE-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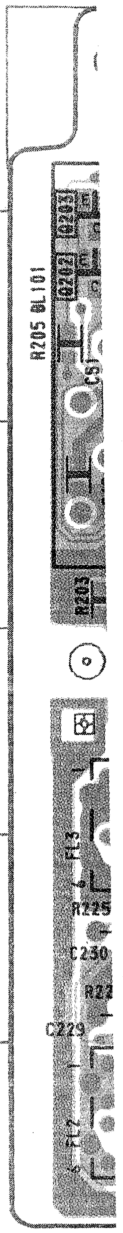
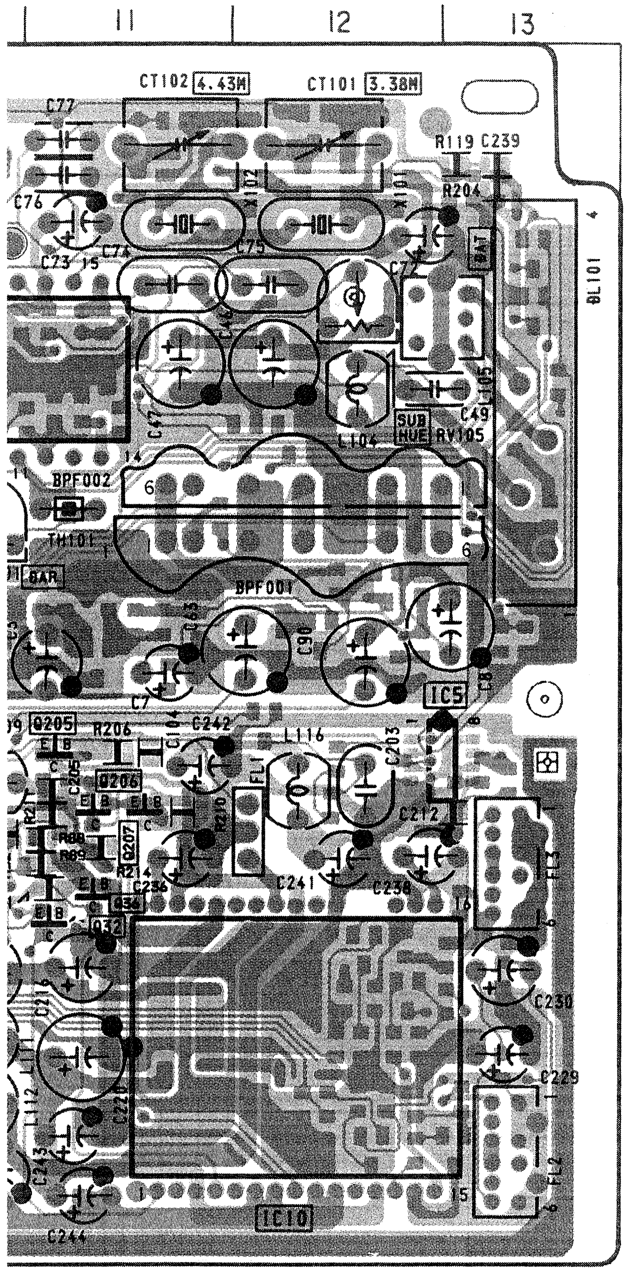
A-1135-692-A
1-639-924-11
CAD
SONY
BA
BA-1
IC1
IC3
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC19
SECAM 10
CT102 4.43M
CT101 3.38M
SUB PIC
RV102
RV103
RV104
RV105
HUE ADJ
SUB COL
SUB HUE
DYNAMIC PIC SW
SW-1
OFF
ON
BPF001
BPF002
TH101
BELL
X101
X102
BL101
BL102
BL103
BL104
FL1
FL2
FL3
FL4
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
B-Y
R-Y
SCP
BAR
GND
32C
32B
32A

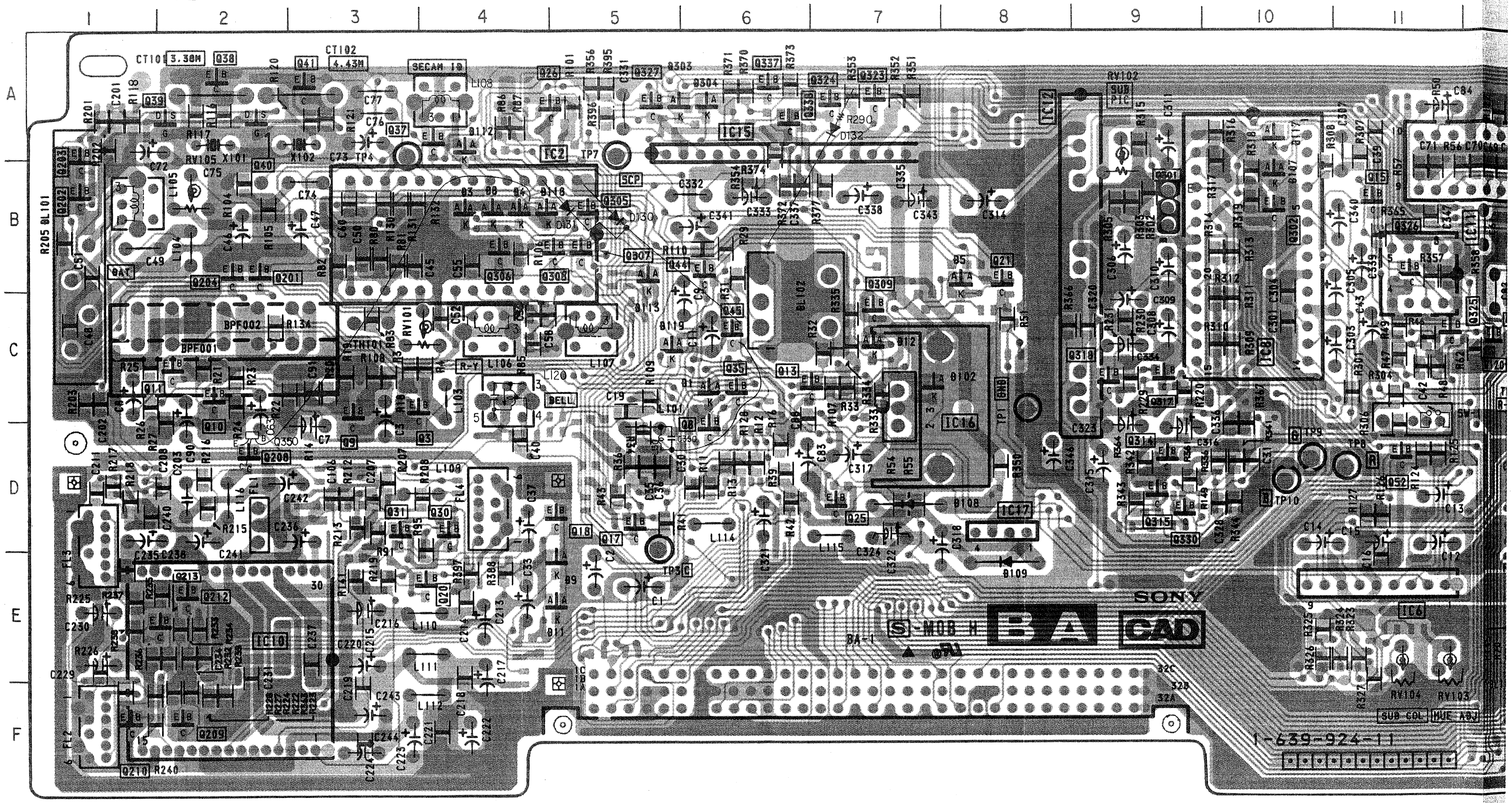
- BA B
-CONI




11
12
13
CT102 4.43M
CT101 3.38M
BPF002
BPF001
BL101
TH101
IC5
IC10
SUB HUE RV105

– BA BAORD –

-CONDUCTOR SIDE-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A
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C
D
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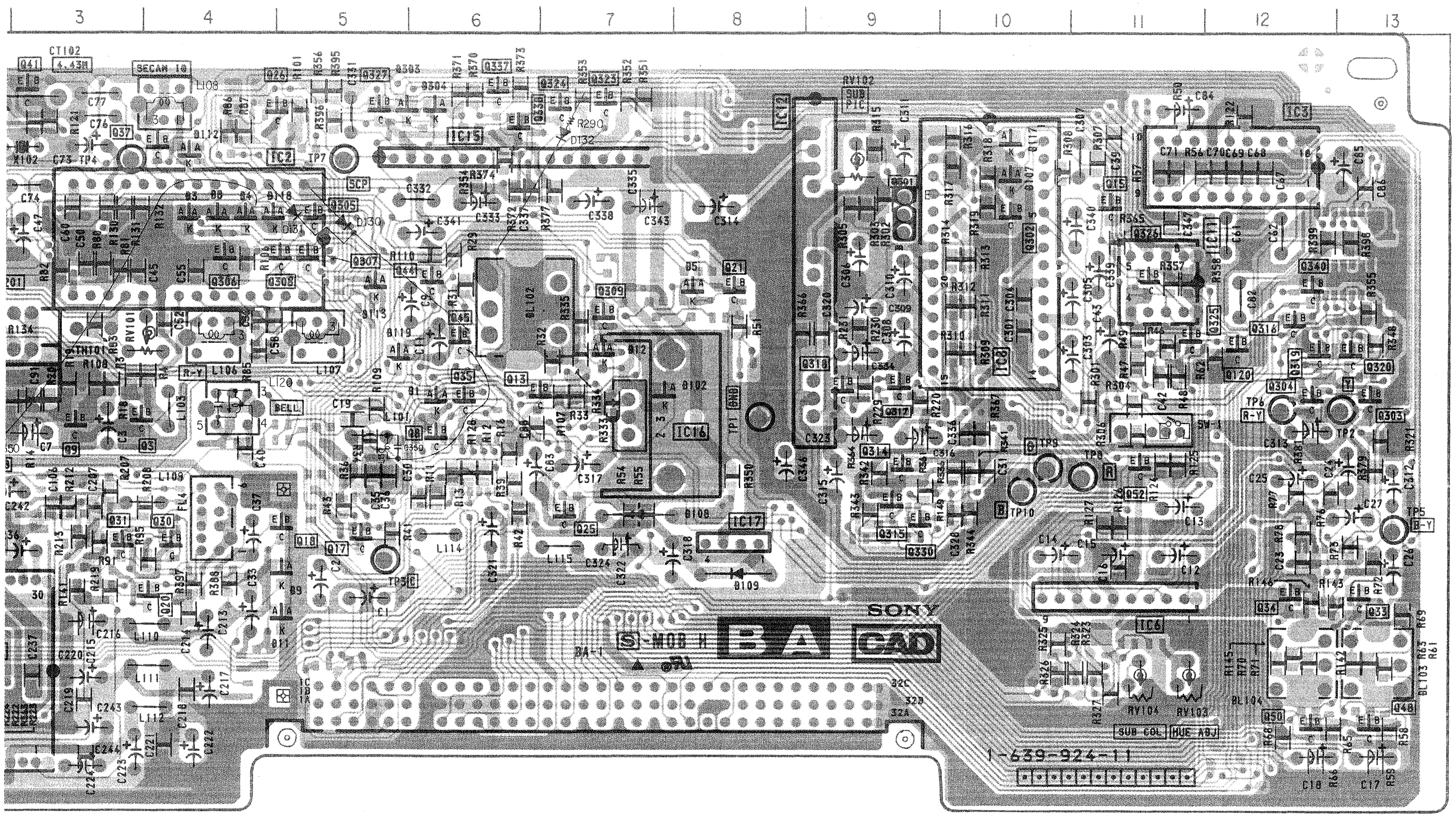
F
CT101 3.38M
CT102 4.43M
SECAM ID
BL101
BL102
BPF001
BPF002
IC2
IC5
IC6
IC8
IC10
IC12
IC15
IC16
IC17
TP1
TP4
TP5
TP7
TP8
TP9
TP10
RV101
RV102 SUB PIC
RV103
RV104
SUB COL
HUE ADJ
SONY
BA
CAD
S-MOB H
BA-1
1-639-924-11

NOTE: (C3, 8, 37, 90, 230, 334, 339, 340)
The polarities of the capacitors above are mounted reversely for silk-screen printing.


3
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12
13
SONY
BA
CAD
S-MOB H
1-639-924-11
IC2
IC3
IC6
IC8
IC11
IC12
IC15
IC16
IC17
SECAM IB
CT102
4.43M
TP1
TP2
TP5
TP6
TP7
TP8
TP9
TP10
R-Y
B-Y
SUB COL
HUE ADJ
RV102
SUB PIC
RV103
RV104
BELL
SW-1
GND
32C
32B
32A

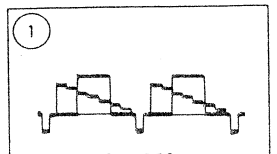
BA BOARD (CONDUCTOR SIDE)

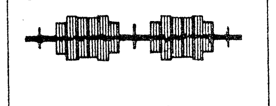
IC	
IC2	B-4
IC3	A-12
IC6	E-11
IC8	C-10
IC10	E-2
IC11	B-11
IC12	A-8
IC15	A-6
IC16	D-8
IC17	D-8
TRANSISTOR	
Q3	C-3
Q8	D-6
Q9	C-3
Q10	C-2
Q11	C-2
Q13	C-6
Q15	B-11
Q17	D-5
Q18	D-5
Q20	E-4
Q21	B-8
Q25	D-7
Q26	A-5
Q30	D-4
Q31	D-3
Q33	E-13
Q34	E-12
Q35	C-6
Q37	A-4
Q38	A-2
Q39	A-2
Q40	A-2
Q41	A-3
Q45	C-6
Q48	F-13
Q50	F-12
Q52	D-11
Q120	C-12
Q201	B-2
Q202	B-1
Q203	A-1
Q204	B-2
Q208	D-2
Q209	F-2
Q210	F-1
Q212	E-2
Q213	E-2
Q301	B-9
Q302	B-10
Q303	C-13
Q304	C-12
Q305	B-5
Q306	B-4
Q307	B-5
Q308	B-5
Q309	C-7
Q314	D-9
Q315	D-9
Q316	C-12
Q317	C-9
Q318	C-9
Q319	C-12
Q320	C-13
Q323	A-7
Q324	A-7
Q325	C-11
Q326	B-11
Q327	A-5
Q330	D-9
Q337	A-6
Q338	A-6
Q340	B-12
Q350	D-2
DIODE	
D1	C-6
D3	B-4
D4	B-4
D5	B-8
D8	B-4
D9	E-5
D11	E-5
D12	C-7
D102	C-7
D107	B-10
D108	D-7
D109	D-8
D112	A-4
D113	B-5
D117	A-10
D118	B-5
D119	C-5
D130	B-5
D131	B-5
D132	A-7
D303	A-5
D304	A-6
VARIABLE RESISTOR	
CT101	A-2
CT102	A-3
RV101	C-3
RV102	A-9
RV103	E-11
RV104	E-11
RV105	B-2

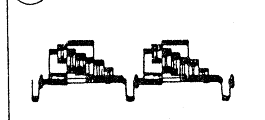
NOTE: (C3, 8, 37, 90, 230, 334, 339, 340)
The polarities of the capacitors above are mounted reversely for silk-screen printing.

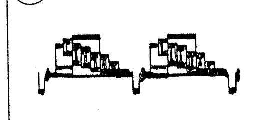
- ▨ : Pattern from the side which enables seeing.
- ▩ : Pattern of the rear side.

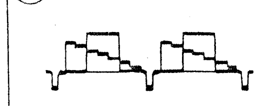
BB BAORD (1/2)

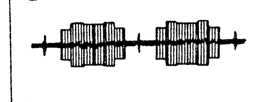
①

S-VIDEO
0.9Vp-p (H)

②

S-VIDEO
0.5Vp-p (H)

③

1Vp-p (H)

④

1Vp-p (H)

⑤

S-VIDEO
1Vp-p (H)

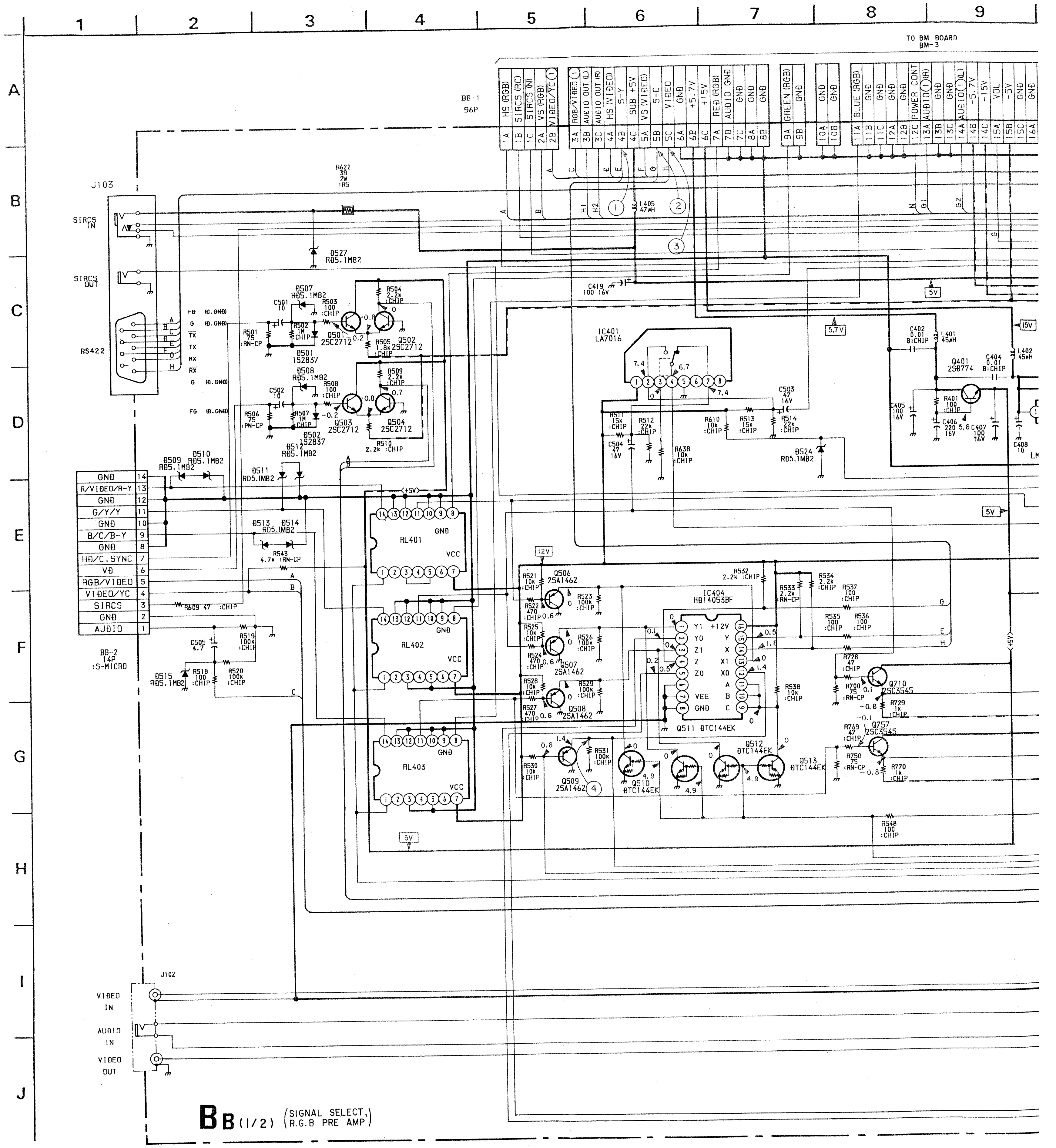
⑥

S-VIDEO
0.32Vp-p (H)

BB (1/2)	IC401	LA7016	SYNC. SW-1	531	DTC144EK	MODE SW-12
	402	LM7812CT	+12V REG	532	2SC2712	AUDIO AMP-4
	403	LM7912CT	–12V REG	533	2SC2712	AUDIO BUFF-3
	404	MC14053BF	SIG. SW	534	2SD789	MODE SW-13
	405	SN74HC157ANS	MODE SW-1	535	DTC144EK	MODE SW-14
	407	SN74HC157ANS	SYNC SW-2	536	DTC144EK	MODE SW-15
	408	HD14053BFP	MODE SW-2	537	DTC144EK	MODE SW-16
	409	HD14053BFP	MODE SW-3	538	DTC144EK	MODE SW-17
	412	μPC1406HA	AUDIO ATT.	540	DTC144EK	MODE SW-18
	422	μPC393G2	MODE ENCODER-1	545	2SA1162	MODE SW-23
	423	SN74HC32ANS	MODE ENCODER-2	546	DTC144EK	MODE SW-24
	424	μPC393G2	MODE ENCODER-3	548	DTC144EK	MODE SW-26
				549	DTC144EK	MODE SW-27
	Q401	2SD774	+5REG.	550	DTC144EK	MODE SW-28
	402	2SB734	–5REG.	551	DTC144EK	MODE SW-29
	403	DTC144EK	POWER CONT-1	552	DTC144EK	MODE SW-30
	404	2SC2712	POWER CONT-2	553	2SC2712	AUDIO BUFF-2
	405	DTC144EK	POWER CONT-3	710	2SC3545	G BUFF-5
	450	2SC2712	SIRCS SW-1	741	DTC144EK	MODE SW-31
	451	2SC2712	SIRCS SW-2	757	2SC3545	B BUFF-7
	452	2SC2712	SIRCS SW-3	800	2SC2785-HFE	
	453	DTC144EK	SIRCS SW-4			
	454	DTC144EK	SIRCS SW-5	D401	V06C	+12V PROT
	456	2SC2712	SIRCS SW-6	402	V06C	–12V PROT
	457	2SA1162	SIRCS SW-7	450	1S2837	SIRCS OR
	501	2SC2712	H.SYNC SW-1	451	1S2837	AUDIO PROT-1
	502	2SC2712	H.SYNC SW-2	452	RD2.4ES-B1	LEBEL SHIFT
	503	2SC2712	V.SYNC SW-1	501	1S2837	H.SYNC CLAMP
	504	2SC2712	V.SYNC SW-2	502	1S2837	V.SYNC CLAMP
	506	2SA1462	R BUFF.	503	1S2837	VOLTAGE PROT.
	507	2SA1462	G BUFF.	504	RD5.1M-B2	AUDIO PROT-2
	508	2SA1462	B BUFF.	506	RD5.1M-B2	POW CONT.
	509	2SA1462	VIDEO BUFF.	507	RD5.1M-B2	H.SYNC PROT
	510	DTC144EK	MODE SW-1	508	RD5.1M-B2	V.SYNC PROT
	511	DTC144EK	MODE SW-2	509	RD5.1M-B2	R PROT-1
	512	DTC144EK	MODE SW-3	510	RD5.1M-B2	R PROT-2
	513	DTC144EK	MODE SW-4	511	RD5.1M-B2	G PROT-1
	514	DTC144EK	MODE SW-5	512	RD5.1M-B2	G PROT-2
	515	2SC2712	MODE SW-6	513	RD5.1M-B2	B PROT-1
	516	2SA1462	Y BUFF-1	514	RD5.1M-B2	B PROT-2
	517	2SA1462	C BUFF-1	515	RD5.1M-B2	AUDIO PROT-4
	518	2SC2712	AUDIO BUFF-1	516	RD13M-B2	Y PROT.
	519	2SC2712	AUDIO BUFF-2	518	RD13M-B2	C PROT.
	520	DTC144EK	MODE SW-7	520	RD5.1M-B2	S SW PROT-1
	521	DTC144EK	MODE SW-8	521	RD5.1M-B2	S SW PROT-2
	522	2SC2712	VIDEO AMP-1	522	RD13M-B2	VIDEO PROT-1
	523	2SC2712	VIDEO AMP-2	523	RD13M-B2	VIDEO PROT-2
	524	2SC2712	VIDEO BUFF-2	524	RD5.1M-B2	HD SEL PROT.
	525	2SC2712	AUDIO AMP-1	525	RD2.4ES-B1	LEBEL SHIFT
	526	2SC2712	AUDIO AMP-2	526	1S2837	MODE SW-1
	527	2SC2712	AUDIO AMP-3	527	RD5.1M-B2	SUB5V PROT
	528	DTC144EK	MODE SW-9	528	1S2837	MODE SW-2
	529	DTC144EK	MODE SW-10	529	RD3.3ES-B1	LEBEL SHIFT
	530	DTC144EK	MODE SW-11	530	1S2837	AUDIO MUTE

BB BOARD (1/2)

REF.	Pin No.	NTSC 3.58	S-VIDEO
IC404	②	0.1	1.6
	④	0.5	1.4
	⑤	0.1	1.4
	⑫	1.4	0.1
	⑭	1.8	0.5
	⑮	0.5	2
IC405	⑥	4.5	0
	⑦	4.8	0
IC408	③	4.5	0
	④	4.5	0
	⑩	4.6	4.8
	⑪	4.5	4.6
IC423	②	4.9	0

REF.		NTSC 3.58	S-VIDEO
Q509	B	0.6	0.6
	C	–	–
	E	1.4	0
Q516	B	0.6	0.6
	C	0.1	1.6
	E	–	–
Q517	B	0.6	0.6
	C	0.1	1.4
	E	–	–
Q528	B	4.9	0
	C	0	4.1
	E	–	–
Q529	B	0	1.4
	C	4.1	0
	E	–	–
Q530	B	4.9	0
	C	0.1	1.6
	E	–	–
Q531	B	4.9	0
	C	0.1	1.4
	E	–	–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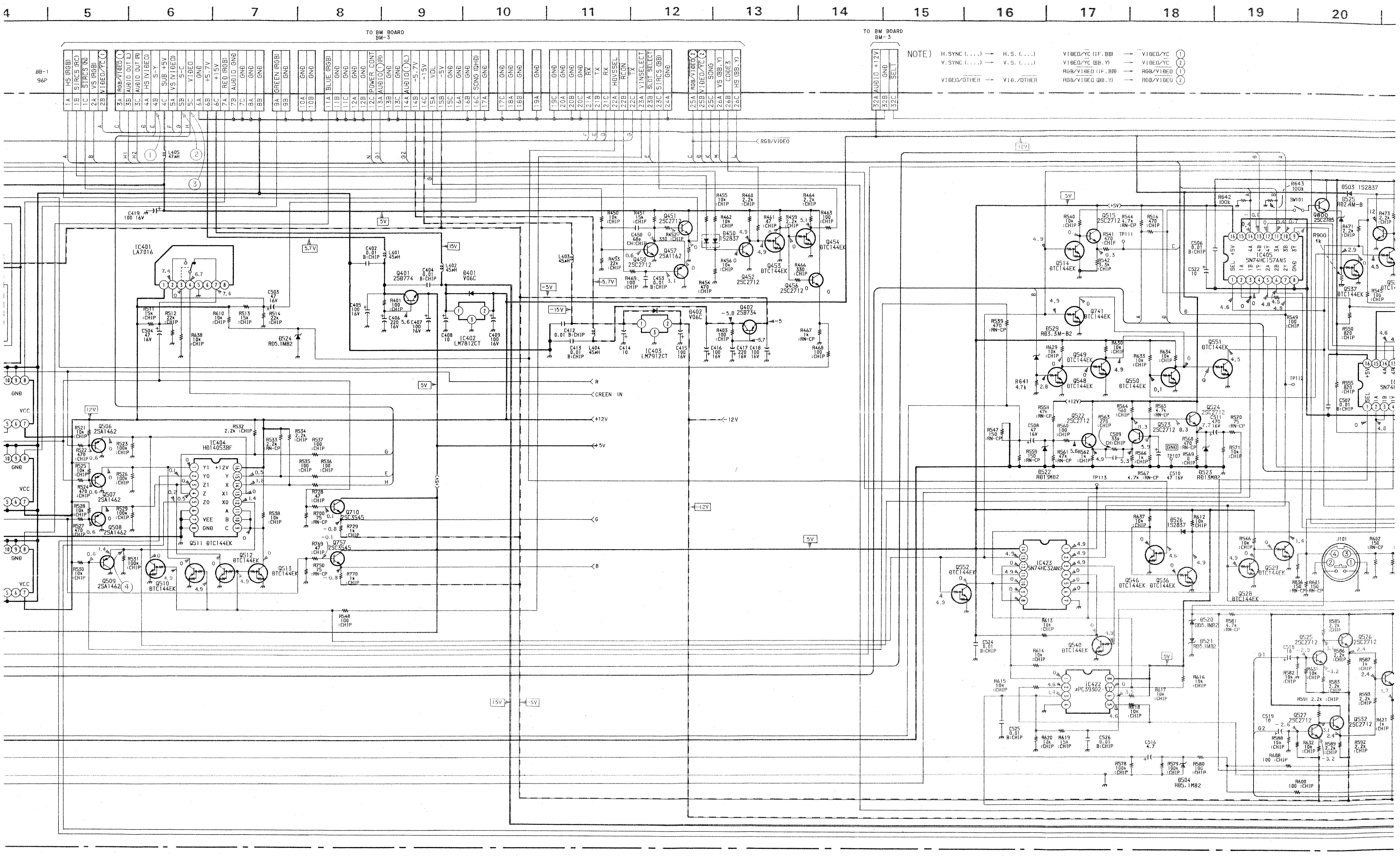
TO BM BOARD BM-3
BB-1 96P
HS (RGB)
SIRCS (RC)
SIRCS (N)
VS (RGB)
VIDEO/YC (1)
RGB/VIDEO (2)
AUDIO OUT (L)
AUDIO OUT (R)
HS (VIDEO)
S-Y
SUB +5V
VS (VIDEO)
S-C
VIDEO
GND
+5.7V
+15V
RED (RGB)
AUDIO GND
GREEN (RGB)
BLUE (RGB)
POWER CONT
AUDIO (1)(R)
AUDIO (1)(L)
-5.7V
VOL
-5V
J103
SIRCS IN
SIRCS OUT
RS422
IC401 LA7016
IC404 HD14053BF
RL401
RL402
RL403
GND
VCC
Q401 2SD774
L401 45μH
L405 47μH
Q501 2SC2712
Q502 2SC2712
Q503 2SC2712
Q504 2SC2712
Q506 2SA1462
Q507 2SA1462
Q508 2SA1462
Q509 2SA1462
Q510 DTC144EK
Q511 DTC144EK
Q512 DTC144EK
Q513 DTC144EK
Q710 2SC3545
Q757 2SC3545
GND
R/VIDEO/R-Y
G/Y/Y
B/C/B-Y
HD/C.SYNC
VD
RGB/VIDEO
VIDEO/YC
SIRCS
AUDIO
BB-2 14P :S-MICRO
J102
VIDEO IN
AUDIO IN
VIDEO OUT
5V
12V
15V
5.7V
B B (1/2) (SIGNAL SELECT, R.G.B PRE AMP)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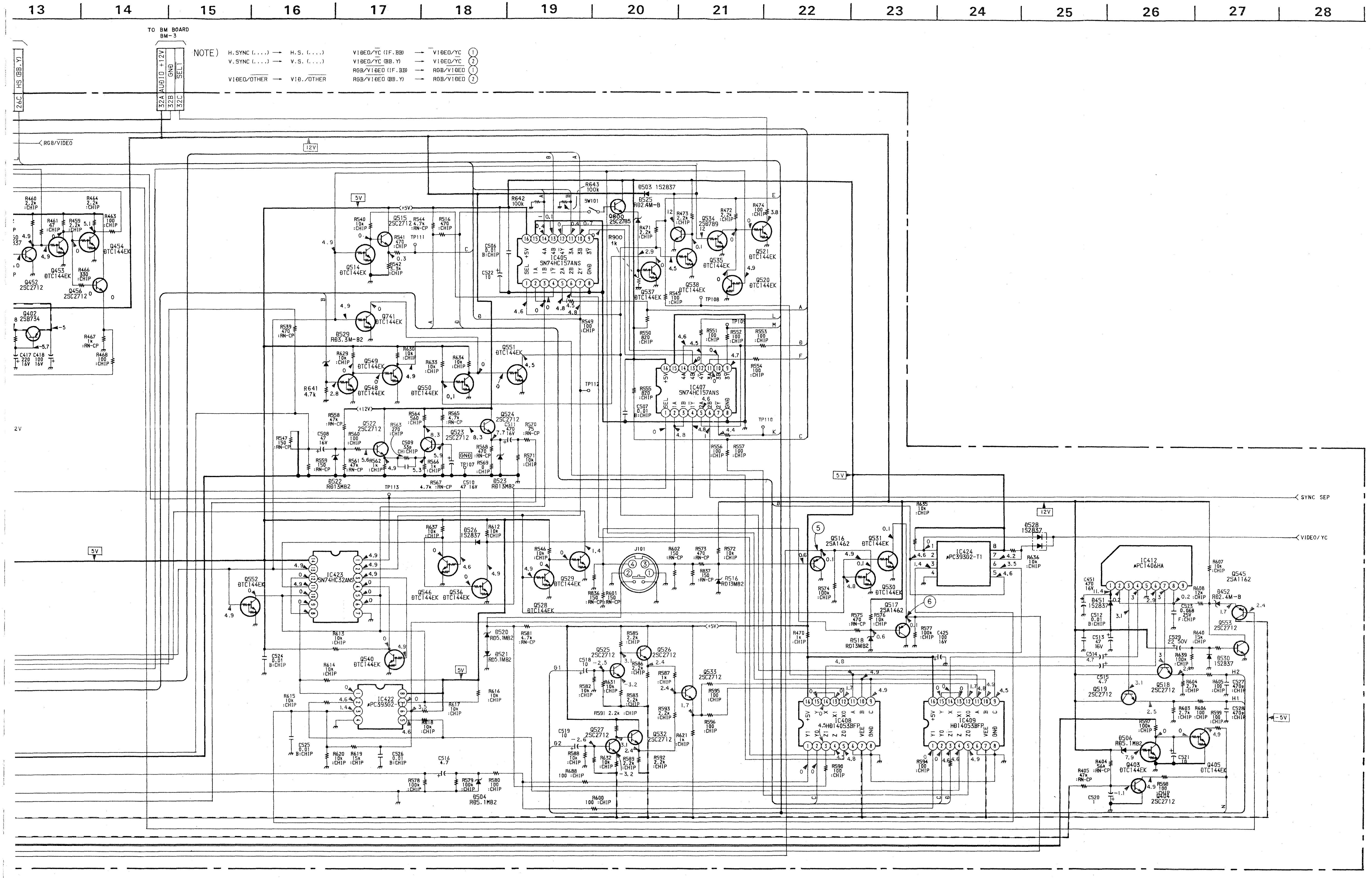
TO BM BOARD BM-3
BB-1 96P
HS (RGB)
S.IRCS (RC)
S.IRCS (N)
VS (RGB)
VIDEO/YC ①
RGB/VIDEO ①
AUDIO OUT (L)
AUDIO OUT (R)
HS (VIDEO)
S-Y
SUB +5V
VS (VIDEO)
S-C
VIDEO
GND
+5.7V
+15V
RED (RGB)
AUDIO GND
GREEN (RGB)
BLUE (RGB)
POWER CONT
VOL
SONG (QHD)
RX
TX
HDVSSEL
RCON
VINSELECT
SLOT SELECT
S.IRCS (BB)
RGB/VIDEO ②
VIDEO/YC ②
SONG
VS (BB.Y)
CDBE3
HS (BB.Y)
AUDIO +12V
GND
SEL1
NOTE)
H.SYNC (....) → H.S. (....)
V.SYNC (....) → V.S. (....)
VIDEO/OTHER → VID./OTHER
VIDEO/YC (IF.BB) → VIDEO/YC ①
VIDEO/YC (BB.Y) → VIDEO/YC ②
RGB/VIDEO (IF.BB) → RGB/VIDEO ①
RGB/VIDEO (BB.Y) → RGB/VIDEO ②
RGB/VIDEO
IC401 LA7016
IC402 LM7812CT
IC403 LM7912CT
IC404 HD14053BF
IC405 SN74HC157ANS
IC422 μPC59302
IC423 SN74HC32ANS
Q401 2SB774
Q402 2SB734
Q450 2SC2712
Q451 2SC2712
Q452 2SC2712
Q453 DTC144EK
Q454 DTC144EK
Q456 2SC2712
Q457 2SA1162
Q506 2SA1462
Q507 2SA1462
Q508 2SA1462
Q509 2SA1462
Q510 DTC144EK
Q511 DTC144EK
Q512 DTC144EK
Q513 DTC144EK
Q514 DTC144EK
Q515 2SC2712
Q522 2SC2712
Q523 2SC2712
Q524 2SC2712
Q525 2SC2712
Q526 2SC2712
Q527 2SC2712
Q528 DTC144EK
Q529 DTC144EK
Q532 2SC2712
Q536 DTC144EK
Q537 DTC144EK
Q540 DTC144EK
Q546 DTC144EK
Q548 DTC144EK
Q549 DTC144EK
Q550 DTC144EK
Q551 DTC144EK
Q552 DTC144EK
Q710 2SC3545
Q741 DTC144EK
Q757 2SC3545
Q800 2SC2785
D401 V06C
D402 V06C
D450 1S2837
D503 1S2837
D504 RD5.1MB2
D520 RD5.1MB2
D521 RD5.1MB2
D522 RD13MB2
D523 RD13MB2
D524 RD5.1MB2
D525 RD2.4M-B
D526 1S2837
D529 RD3.3M-B2
SW101
J101
GREEN IN
+12V
+5V
-5.7V
-15V
-5V
15V
5.7V
12V
5V
TP107
TP112
TP113
GND
VCC


13
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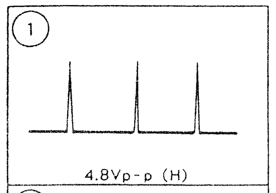
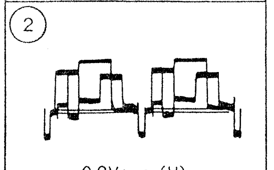
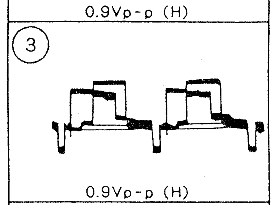
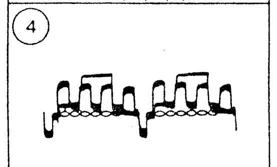
28
TO BM BOARD BM-3
AUDIO +12V
GND
SEL1
32A
32B
32C
HS (BB.Y)
26C
NOTE)
H.SYNC (....) → H.S. (....)
V.SYNC (....) → V.S. (....)
VIDEO/OTHER → VID./OTHER
VIDEO/YC (IF.BB) → VIDEO/YC ①
VIDEO/YC (BB.Y) → VIDEO/YC ②
RGB/VIDEO (IF.BB) → RGB/VIDEO ①
RGB/VIDEO (BB.Y) → RGB/VIDEO ②
RGB/VIDEO
12V
5V
IC405 SN74HC157ANS
IC407 SN74HC157ANS
IC423 SN74HC32ANS
IC422 μPC393G2
IC424 μPC393G2-T1
IC412 μPC1406HA
IC408 HD14053BFP
IC409 HD14053BFP
J101
SW101
Q800 2SC2785
Q402 2SB734
Q452 2SC2712
Q453 DTC144EK
Q454 DTC144EK
Q456 2SC2712
Q514 DTC144EK
Q515 2SC2712
Q741 DTC144EK
Q548 DTC144EK
Q549 DTC144EK
Q550 DTC144EK
Q551 DTC144EK
Q522 2SC2712
Q523 2SC2712
Q524 2SC2712
Q521 DTC144EK
Q520 DTC144EK
Q534 2SB789
Q535 DTC144EK
Q537 DTC144EK
Q538 DTC144EK
Q546 DTC144EK
Q536 DTC144EK
Q529 DTC144EK
Q528 DTC144EK
Q552 DTC144EK
Q540 DTC144EK
Q525 2SC2712
Q526 2SC2712
Q527 2SC2712
Q532 2SC2712
Q533 2SC2712
Q516 2SA1462
Q517 2SA1462
Q531 DTC144EK
Q530 DTC144EK
Q518 2SC2712
Q519 2SC2712
Q545 2SA1162
Q553 2SC2712
Q403 DTC144EK
Q404 2SC2712
Q405 DTC144EK
D503 1SS2837
D525 RD2.4M-B
D529 RD3.3M-B2
D522 RD13MB2
D523 RD13MB2
D526 1S2837
D520 RD5.1MB2
D521 RD5.1MB2
D516 RD13MB2
D518 RD13MB2
D504 RD5.1MB2
D528 1S2837
D530 1S2837
D506 RD5.1MB2
D451 1S2837
D452 RD2.4M-B
TP107
TP108
TP109
TP110
TP111
TP112
TP113
SYNC SEP
VIDEO/YC
-5V

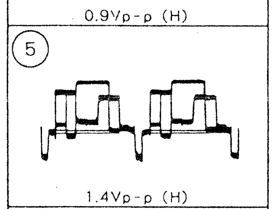
BB BAORD (2/2)

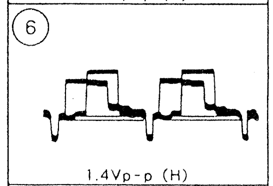


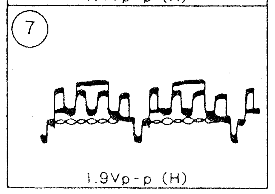










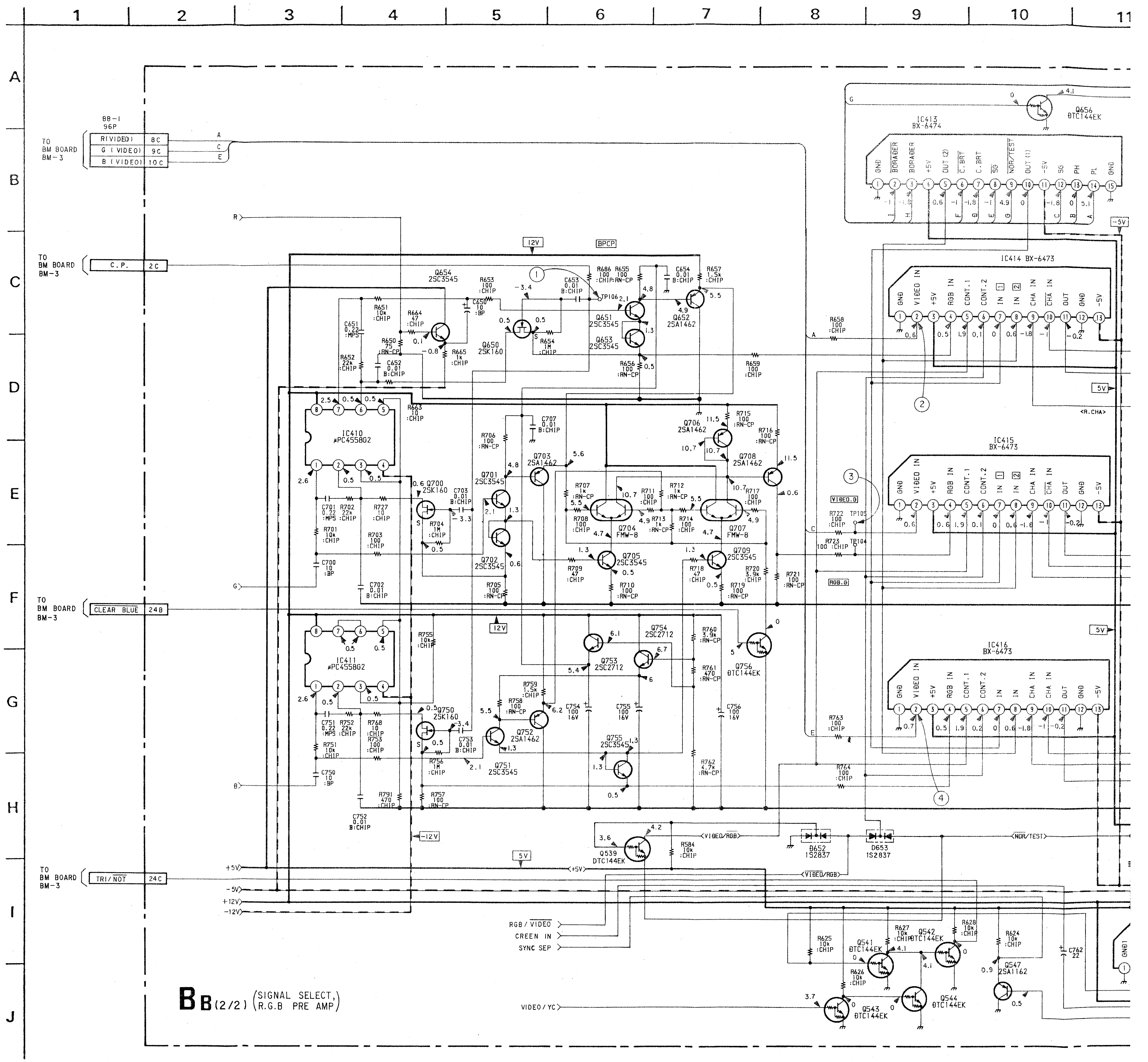


BB (2/2)	IC410	μPC4558G2	SIG. CLAMP-1
	411	μPC4558G2	SIG. CLAMP-2
	413	BX-6474	TEST SIG. GEN.
	414	BX-6473	R SIG. SW
	415	BX-6473	G SIG. SW
	416	BX-6473	B SIG. SW
	417	BX-7913	S ON G SYNC SEP.
	418	BX-6475	R AMP.
	419	BX-6475	G AMP.
	420	BX-6475	B AMP.
	Q539	DTC144EK	MODE SW-17
	541	DTC144EK	MODE SW-19
	542	DTC144EK	MODE SW-20
	543	DTC144EK	MODE SW-21
	544	DTC144EK	MODE SW-22
	547	2SA1162	MODE SW-25
	650	2SK160	R CLAMP
	651	2SC3545	R BUFF-1
	652	2SA1462	R BUFF-2
	653	2SC3545	R BUFF-3
	654	2SC3545	R BUFF-4
	656	DTC144EK	MODE SW-31
	700	2SK160	G CLAMP
	701	2SC3545	G BUFF-1
	702	2SC3545	G BUFF-2
	703	2SA1462	G BUFF-3
	704	FMW-8	CB SW-1
	705	2SC3545	CB SW-2
	706	2SA1462	CB SW-3
	707	FMW-8	CB SW-4
	708	2SA1462	G BUFF-4
	709	2SC3545	CB SW-5
	750	2SK160	B CLAMP
	751	2SC3545	B BUFF-1
	752	2SA1462	B BUFF-2
	753	2SC2712	B BUFF-3
	754	2SC2712	B BUFF-4
	755	2SC3545	B BUFF-5
	756	DTC144EK	B BUFF-6
	D634	1S2837	MODE OR-1
	652	1S2837	MODE OR-2
	653	1S2837	MODE OR-3

BB BOARD (2/2)

REF.	Pin No.	NTSC 3.58	S-VIDEO
IC414	②	0.6	3.1
	⑪	− 0.2	2.2
IC415	②	0.6	3.1
	⑪	− 0.2	2.2
IC416	②	0.7	3.1
	⑪	− 0.2	2.3

REF.		NTSC 3.58	S-VIDEO
Q539	B	3.6	2.4
	C	4.2	1.9
	E	–	–
Q656	B	0	4.9
	C	4.1	0
	E	–	–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A
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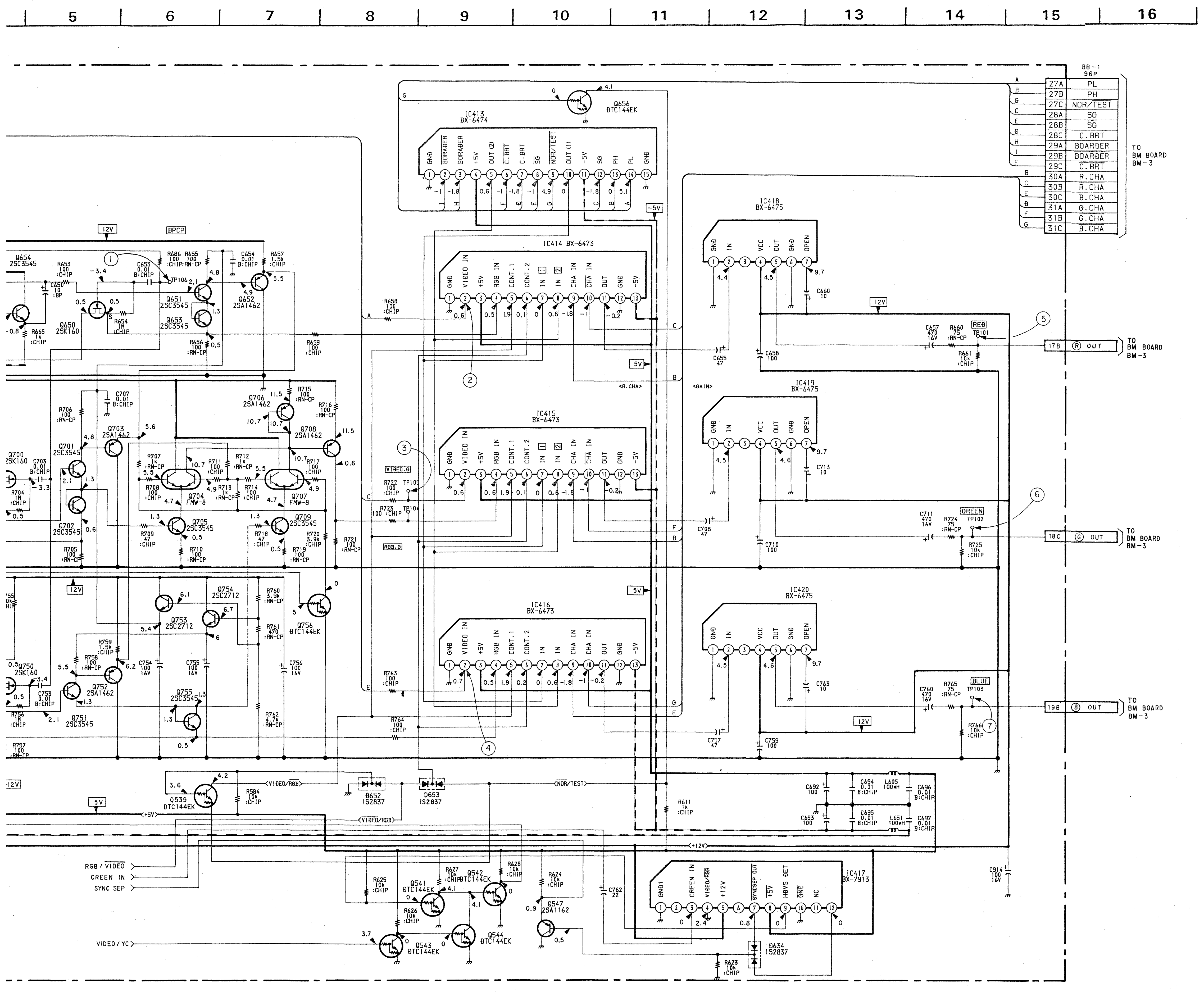
C
D
E
F
G
H
I
J
BB-I 96P
TO BM BOARD BM-3
R(VIDEO) 8C
G (VIDEO) 9C
B (VIDEO) 10C
C.P. 2C
CLEAR BLUE 24B
TRI/NOT 24C
IC410 μPC4558G2
IC411 μPC4558G2
IC413 BX-6474
IC414 BX-6473
IC415 BX-6473
IC416 BX-6473
Q654 2SC3545
Q650 2SK160
Q651 2SC3545
Q652 2SA1462
Q653 2SC3545
Q656 DTC144EK
Q700 2SK160
Q701 2SC3545
Q702 2SC3545
Q703 2SA1462
Q704 FMW-8
Q705 2SC3545
Q706 2SA1462
Q707 FMW-8
Q708 2SA1462
Q709 2SC3545
Q750 2SK160
Q751 2SC3545
Q752 2SA1462
Q753 2SC2712
Q754 2SC2712
Q755 2SC3545
Q756 DTC144EK
Q539 DTC144EK
Q541 DTC144EK
Q542 DTC144EK
Q543 DTC144EK
Q544 DTC144EK
Q547 2SA1162
D652 1S2837
D653 1S2837
12V
BBPCP
-12V
5V
-5V
+5V
+12V
<VIDEO/RGB>
<NOR/TEST>
<R.CHA>
VIDEO.0
RGB.0
RGB / VIDEO
CREEN IN
SYNC SEP
VIDEO / YC
GND
VIDEO IN
RGB IN
CONT.1
CONT.2
CHA IN
OUT

BB(2/2) (SIGNAL SELECT, R.G.B PRE AMP)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14
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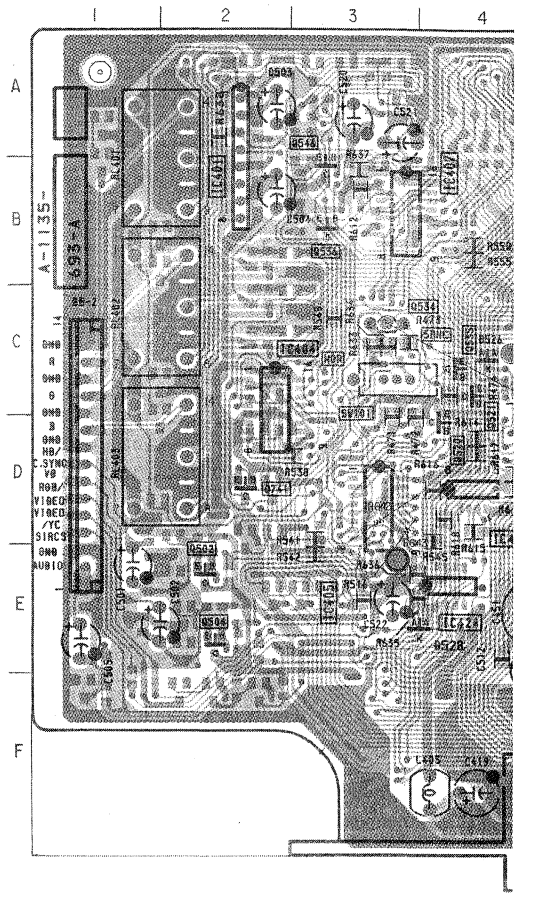
16
IC413 BX-6474
Q656 DTC144EK
IC414 BX-6473
IC415 BX-6473
IC416 BX-6473
IC418 BX-6475
IC419 BX-6475
IC420 BX-6475
IC417 BX-7913
BB-1 96P
27A PL
27B PH
27C NOR/TEST
28A SG
28B SG
28C C.BRT
29A BOARDER
29B BOARDER
29C C.BRT
30A R.CHA
30B R.CHA
30C B.CHA
31A G.CHA
31B G.CHA
31C B.CHA
TO BM BOARD BM-3
17B Ⓡ OUT
18C Ⓖ OUT
19B Ⓑ OUT
RED TP101
GREEN TP102
BLUE TP103
VIDEO.G TP105
RGB.G TP104
BPCP
12V
5V
-5V
<R.CHA>
<GAIN>
<VIDEO/RGB>
<NOR/TEST>
<+5V>
<+12V>
Q654 2SC3545
Q650 2SK160
Q651 2SC3545
Q652 2SA1462
Q653 2SC3545
Q700 2SK160
Q701 2SC3545
Q702 2SC3545
Q703 2SA1462
Q704 FMW-8
Q705 2SC3545
Q706 2SA1462
Q707 FMW-8
Q708 2SA1462
Q709 2SC3545
Q750 2SK160
Q751 2SC3545
Q752 2SA1462
Q753 2SC2712
Q754 2SC2712
Q755 2SC3545
Q756 DTC144EK
Q539 DTC144EK
D652 1S2837
D653 1S2837
D634 1S2837
Q541 DTC144EK
Q542 DTC144EK
Q543 DTC144EK
Q544 DTC144EK
Q547 2SA1162
RGB / VIDEO
GREEN IN
SYNC SEP
VIDEO / YC
①
②
③
④
⑤
⑥
⑦

BB BOARD (COMPONENT SIDE)

IC	
IC401	B-2
IC402	A-12
IC403	C-6
IC404	C-2
IC405	D-3
IC407	B-3
IC408	E-5
IC409	E-8
IC410	D-8
IC411	D-8
IC412	E-5
IC413	B-10
IC414	C-13
IC415	D-13
IC416	E-11
IC418	B-12
IC419	C-12
IC420	D-13
IC422	D-4
IC423	D-5
IC424	E-4
TRANSISTOR	
Q401	A-10
Q402	D-6
Q502	E-2
Q504	E-2
Q517	F-8
Q520	D-4
Q521	C-4
Q522	F-9
Q534	C-3
Q535	C-4
Q536	B-3
Q541	E-10
Q542	E-10
Q543	E-9
Q544	E-9
Q545	E-7
Q546	A-3
Q552	D-5
Q701	D-9
Q702	D-8
Q703	D-9
Q704	D-9
Q707	D-9
Q741	D-2
Q751	D-8
DIODE	
D401	A-13
D402	C-6
D452	E-6
D523	E-9
D526	C-4
D528	E-4
D530	E-9

- BB BAORD -

-COMPONENT SIDE-


1
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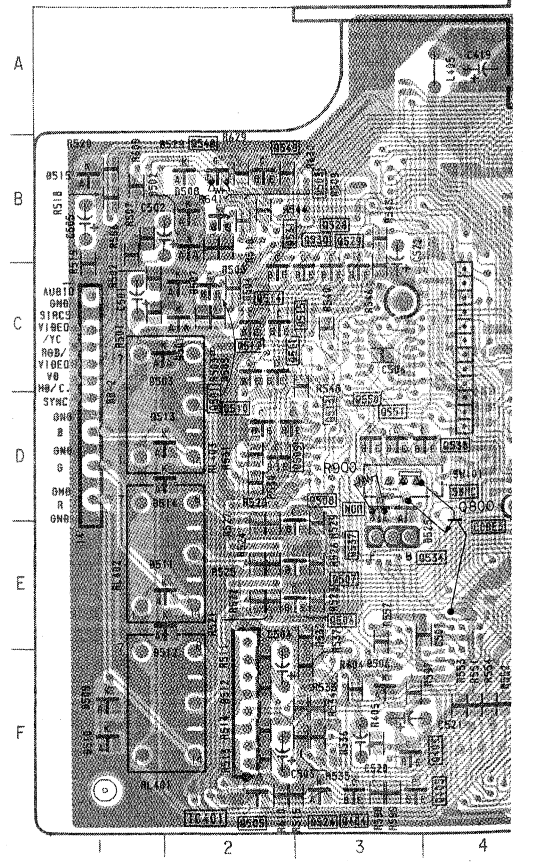
A
B
C
D
E
F
A-1135-693-A

-CONDUCTOR SIDE-


A
B
C
D
E
F
1
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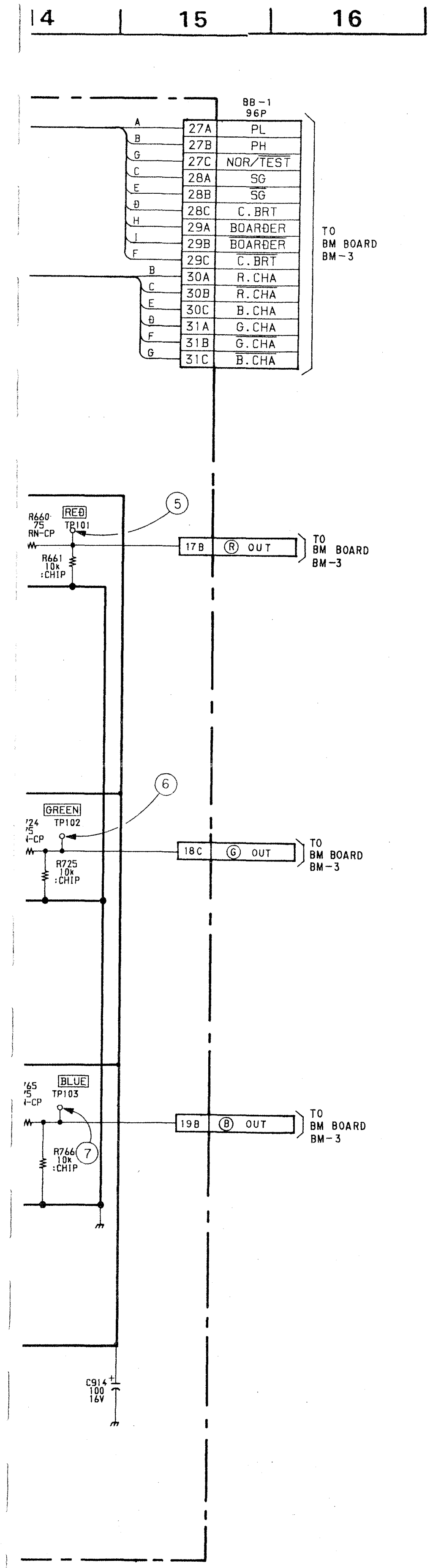

14
15
16
BB-1
96P
27A PL
27B PH
27C NOR/TEST
28A SG
28B SG
28C C.BRT
29A BOARDER
29B BOARDER
29C C.BRT
30A R.CHA
30B R.CHA
30C B.CHA
31A G.CHA
31B G.CHA
31C B.CHA
TO BM BOARD BM-3
R660 75 RN-CP
RED
TP101
5
R661 10k :CHIP
17B Ⓡ OUT
TO BM BOARD BM-3
GREEN
TP102
6
R725 10k :CHIP
18C Ⓖ OUT
TO BM BOARD BM-3
BLUE
TP103
7
R766 10k :CHIP
19B Ⓑ OUT
TO BM BOARD BM-3
C914 100 16V

BB

- BB BAORD -

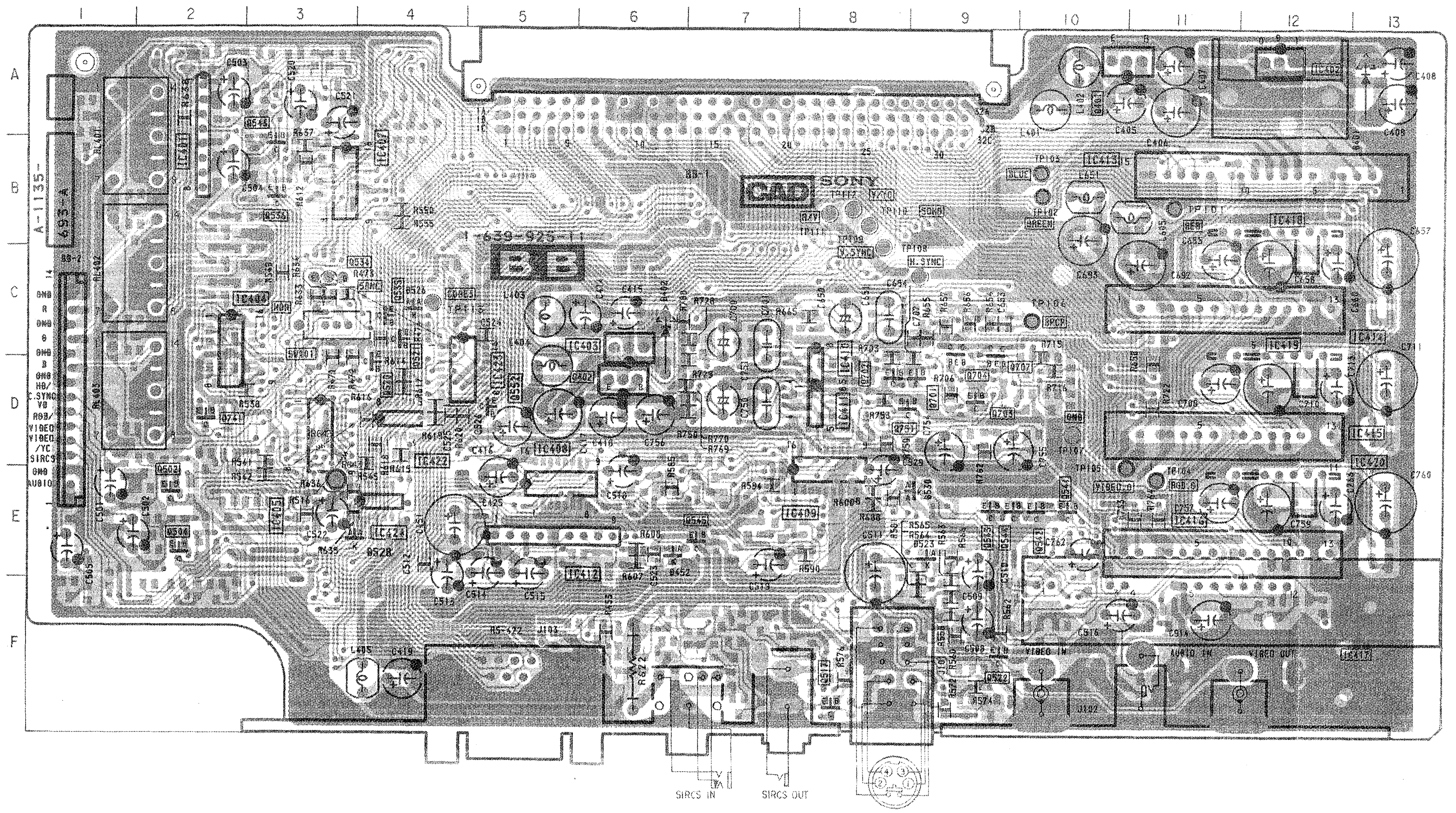
[SIGNAL SELECT, R.G.B PRE AMP]

BB BOARD (COMPONENT SIDE)

IC	
IC401	B-2
IC402	A-12
IC403	C-6
IC404	C-2
IC405	D-3
IC407	B-3
IC408	E-5
IC409	E-8
IC410	D-8
IC411	D-8
IC412	E-5
IC413	B-10
IC414	C-13
IC415	D-13
IC416	E-11
IC418	B-12
IC419	C-12
IC420	D-13
IC422	D-4
IC423	D-5
IC424	E-4

TRANSISTOR	
Q401	A-10
Q402	D-6
Q502	E-2
Q504	E-2
Q517	F-8
Q520	D-4
Q521	C-4
Q522	F-9
Q534	C-3
Q535	C-4
Q536	B-3
Q541	E-10
Q542	E-10
Q543	E-9
Q544	E-9
Q545	E-7
Q546	A-3
Q552	D-5
Q701	D-9
Q702	D-8
Q703	D-9
Q704	D-9
Q707	D-9
Q741	D-2
Q751	D-8

DIODE	
D401	A-13
D402	C-6
D452	E-6
D523	E-9
D526	C-4
D528	E-4
D530	E-9


-COMPONENT SIDE-
1
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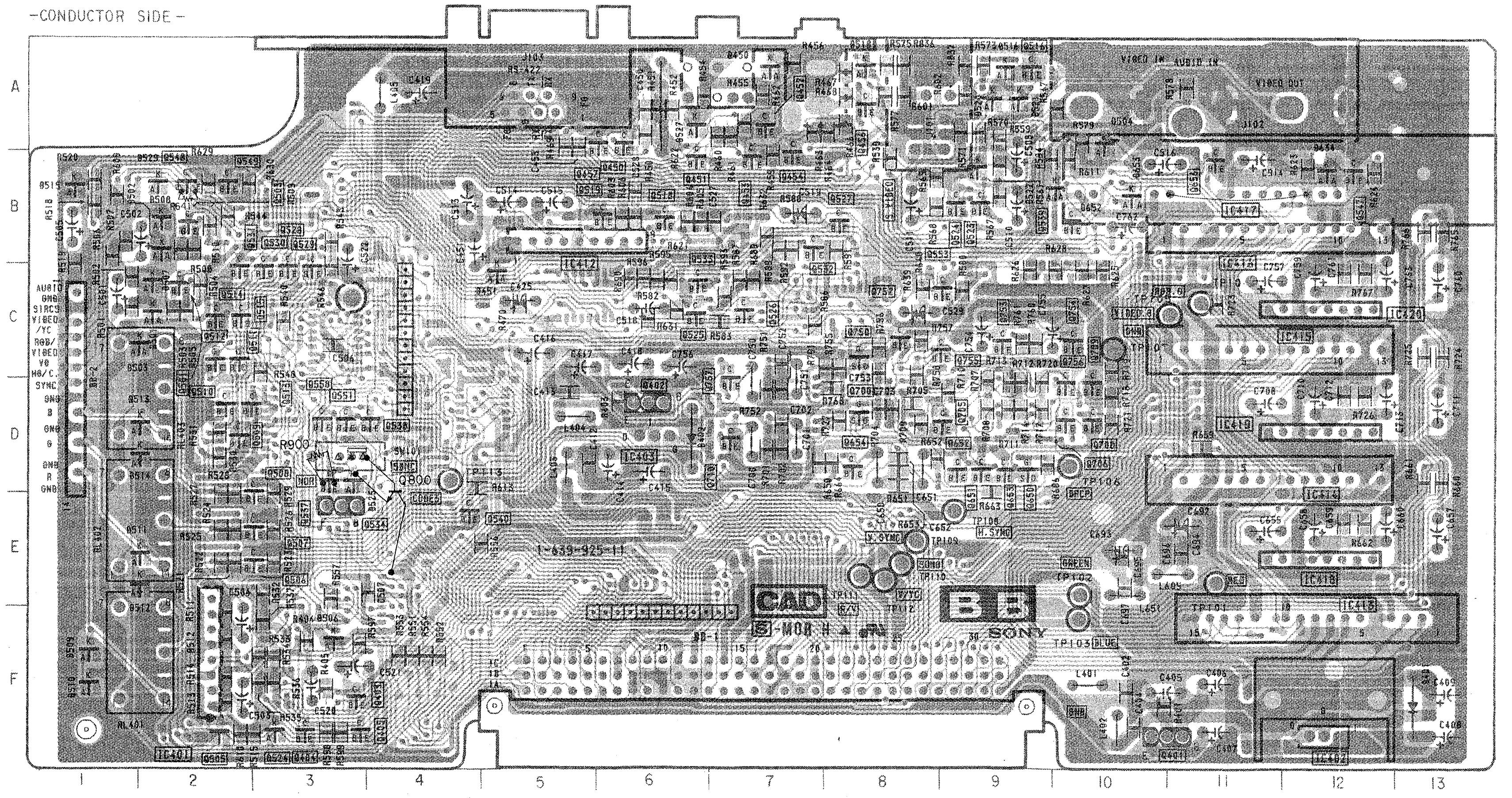
12
13
A
B
C
D
E
F
BB
1-639-925-11
SONY
CAD
A-1135-493-A
SIRCS IN
SIRCS OUT
VIDEO IN
AUDIO IN
VIDEO OUT


-CONDUCTOR SIDE-
A
B
C
D
E
F
1
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4
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6
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8
9
10
11
12
13
BB
SONY
CAD
1-639-925-11
VIDEO IN
AUDIO IN
VIDEO OUT

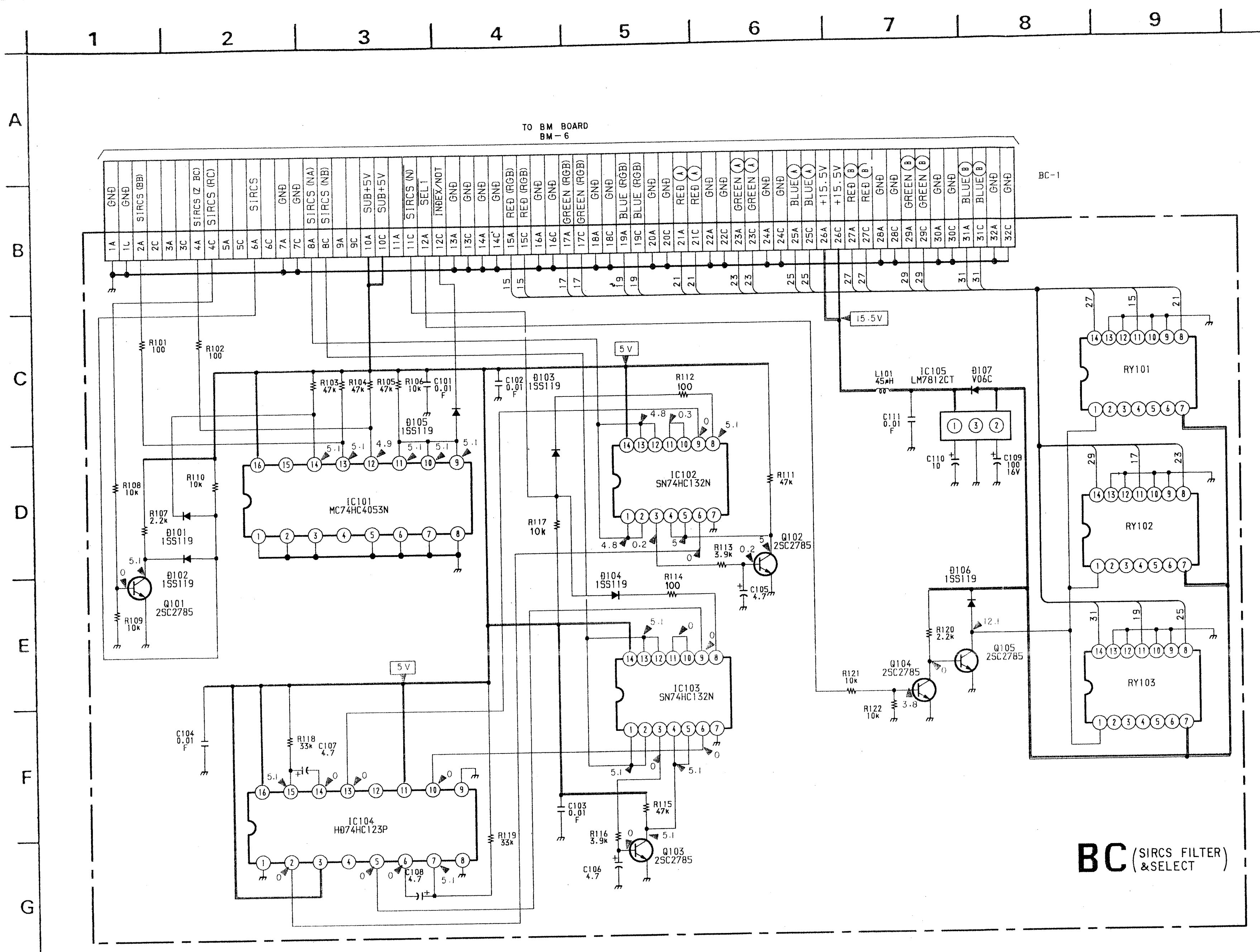
BB BOARD (CONDUCTOR SIDE)

IC	
IC401	F-2
IC402	F-12
IC403	D-6
IC412	B-5
IC413	F-12
IC414	D-12
IC415	C-12
IC416	B-11
IC417	B-11
IC418	E-12
IC419	D-11
IC420	C-12

TRANSISTOR	
Q401	F-11
Q402	D-6
Q403	F-3
Q404	F-3
Q405	F-3
Q450	B-6
Q451	B-6
Q452	A-7
Q453	B-7
Q454	B-7
Q456	A-8
Q457	B-5
Q501	C-2
Q503	B-2
Q506	E-3
Q507	E-3
Q508	D-3
Q509	D-2
Q510	D-2
Q511	C-2
Q512	C-2
Q513	D-3
Q514	C-2
Q515	C-2
Q516	A-9
Q518	B-6
Q519	B-6
Q523	B-9
Q524	B-9
Q525	C-6
Q526	C-7
Q527	B-8
Q528	B-3
Q529	B-3
Q530	B-3
Q531	B-2
Q532	C-7
Q533	C-6
Q534	E-3
Q537	E-3
Q538	D-4
Q539	B-9
Q540	E-4
Q547	B-12
Q543	B-2
Q549	B-2
Q550	D-3
Q551	D-3
Q553	C-8
Q650	D-9
Q651	D-9
Q652	D-9
Q653	D-9
Q654	D-8
Q656	B-11
Q700	D-8
Q705	D-9
Q706	D-10
Q708	D-10
Q709	C-10
Q710	D-7
Q750	C-8
Q752	C-8
Q753	C-9
Q754	C-10
Q755	C-9
Q756	C-10
Q757	D-7
Q800	D-4

DIODE	
D401	F-13
D402	D-6
D450	A-7
D451	C-5
D501	C-2
D502	B-2
D503	C-1
D504	A-10
D506	F-3
D507	C-2
D508	B-2
D509	F-1
D510	F-1
D511	E-1
D512	E-1
D513	D-1
D514	D-1
D515	B-1
D516	A-9
D518	A-8
D520	A-9
D521	A-9
D522	B-9
D524	F-3
D525	D-3
D527	A-6
D529	B-2
D634	B-12
D652	B-10
D653	B-10

- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.


1
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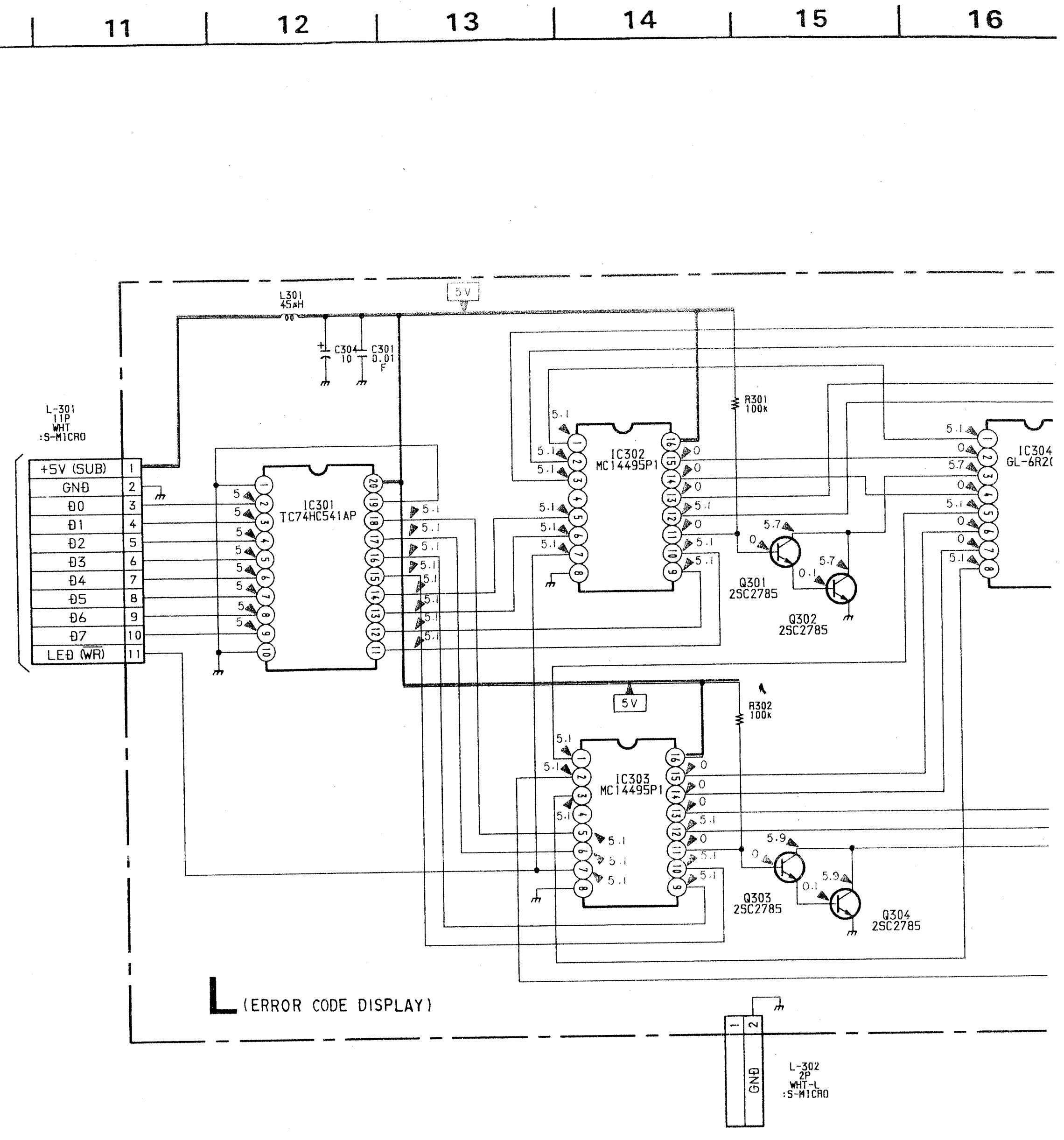
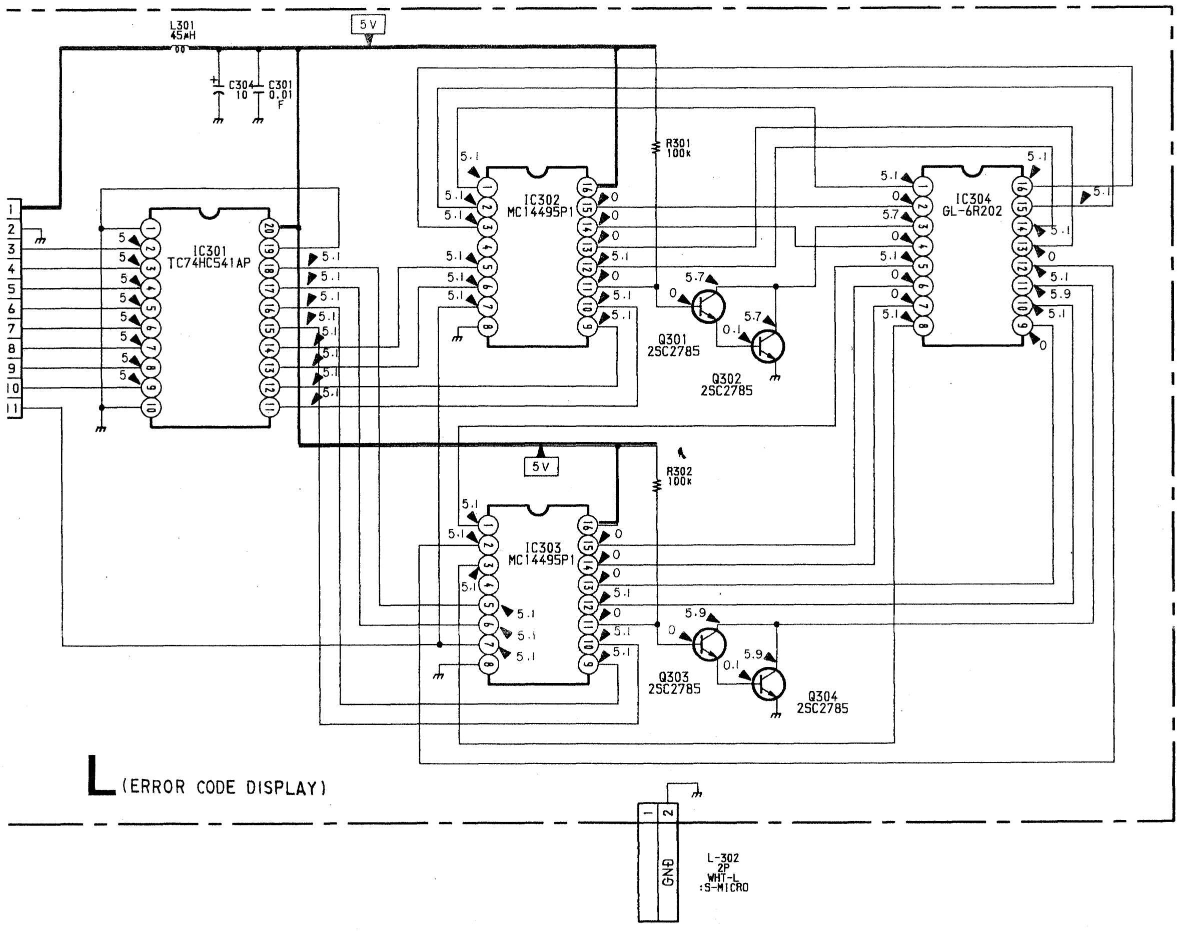
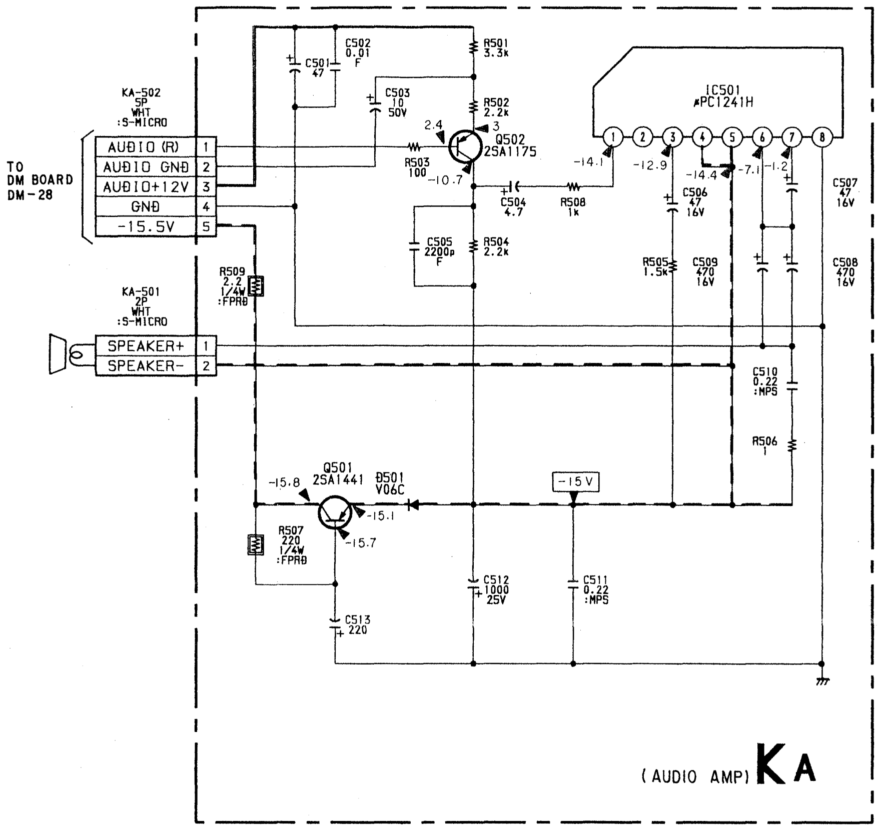
A
B
C
D
E
F
G
TO BM BOARD
BM-6
BC-1
GND
SIRCS (BB)
SIRCS (Z BC)
SIRCS (RC)
SIRCS
SIRCS (NA)
SIRCS (NB)
SUB+5V
SIRCS (N)
SEL1
INDEX/NOT
RED (RGB)
GREEN (RGB)
BLUE (RGB)
RED Ⓐ
GREEN Ⓐ
BLUE Ⓐ
+15.5V
RED Ⓑ
GREEN Ⓑ
BLUE Ⓑ
15.5V
5V
IC101
MC74HC4053N
IC102
SN74HC132N
IC103
SN74HC132N
IC104
HD74HC123P
IC105
LM7812CT
L101
45μH
D107
V06C
RY101
RY102
RY103
Q101
2SC2785
Q102
2SC2785
Q103
2SC2785
Q104
2SC2785
Q105
2SC2785
D101
1SS119
D102
1SS119
D103
1SS119
D104
1SS119
D105
1SS119
D106
1SS119
R101
100
R102
100
R103
47k
R104
47k
R105
47k
R106
10k
R107
2.2k
R108
10k
R109
10k
R110
10k
R111
47k
R112
100
R113
3.9k
R114
100
R115
47k
R116
3.9k
R117
10k
R118
33k
R119
33k
R120
2.2k
R121
10k
R122
10k
C101
0.01
F
C102
0.01
F
C103
0.01
F
C104
0.01
F
C105
4.7
C106
4.7
C107
4.7
C108
4.7
C109
100
16V
C110
10
C111
0.01
F
BC (SIRCS FILTER &SELECT)


11
12
13
14
15
16
L-301
11P
WHT
:S-MICRO
TO
DM BOARD
DM-31
+5V (SUB)
GND
D0
D1
D2
D3
D4
D5
D6
D7
LED (WR)
L301
45μH
5V
C304
10
C301
0.01
F
IC301
TC74HC541AP
IC302
MC14495P1
IC303
MC14495P1
IC304
GL-6R2
R301
100k
R302
100k
Q301
2SC2785
Q302
2SC2785
Q303
2SC2785
Q304
2SC2785
L (ERROR CODE DISPLAY)
GND
L-302
2P
WHT-L
:S-MICRO

BC	IC101	MC74HC4053N	SIRCS SW.
	102	SN74HC132AN	BUFF 1
	103	SN74HC132AN	BUFF 2
	104	HD74HC123P	GATE PULSE GEN
	105	LM7812CT	+12V REG
	Q101	2SC2785	SIRCS INV1
	102	2SC2785	SIRCS INV2
	103	2SC2785	SIRCS INV3
	104	2SC2785	MODE SW1
	105	2SC2785	MODE SW2
	D101	1SS119	SIRCS OR1
	102	1SS119	SIRCS OR2
	103	1SS119	SIRCS OR3
	104	1SS119	SIRCS OR4
	105	1SS119	SW
	106	1SS119	RY PROT
	107	V06C	+12V REG PROT

L	IC301	TC74HC541AP	DECODE
	302	MC14495P1	DECODE
	303	MC14495P1	DECODE
	304	GL-6R202	DISPLAY
	Q301	2SC2785	BUFF.
	302	2SC2785	BUFF.
	303	2SC2785	BUFF.
	304	2SC2785	BUFF.


L301 45µH
5V
C304 10
C301 0.01 F
IC301 TC74HC541AP
IC302 MC14495P1
IC303 MC14495P1
IC304 GL-6R202
R301 100k
R302 100k
Q301 2SC2785
Q302 2SC2785
Q303 2SC2785
Q304 2SC2785
L (ERROR CODE DISPLAY)
GND
L-302 2P WHT-L :S-MICRO

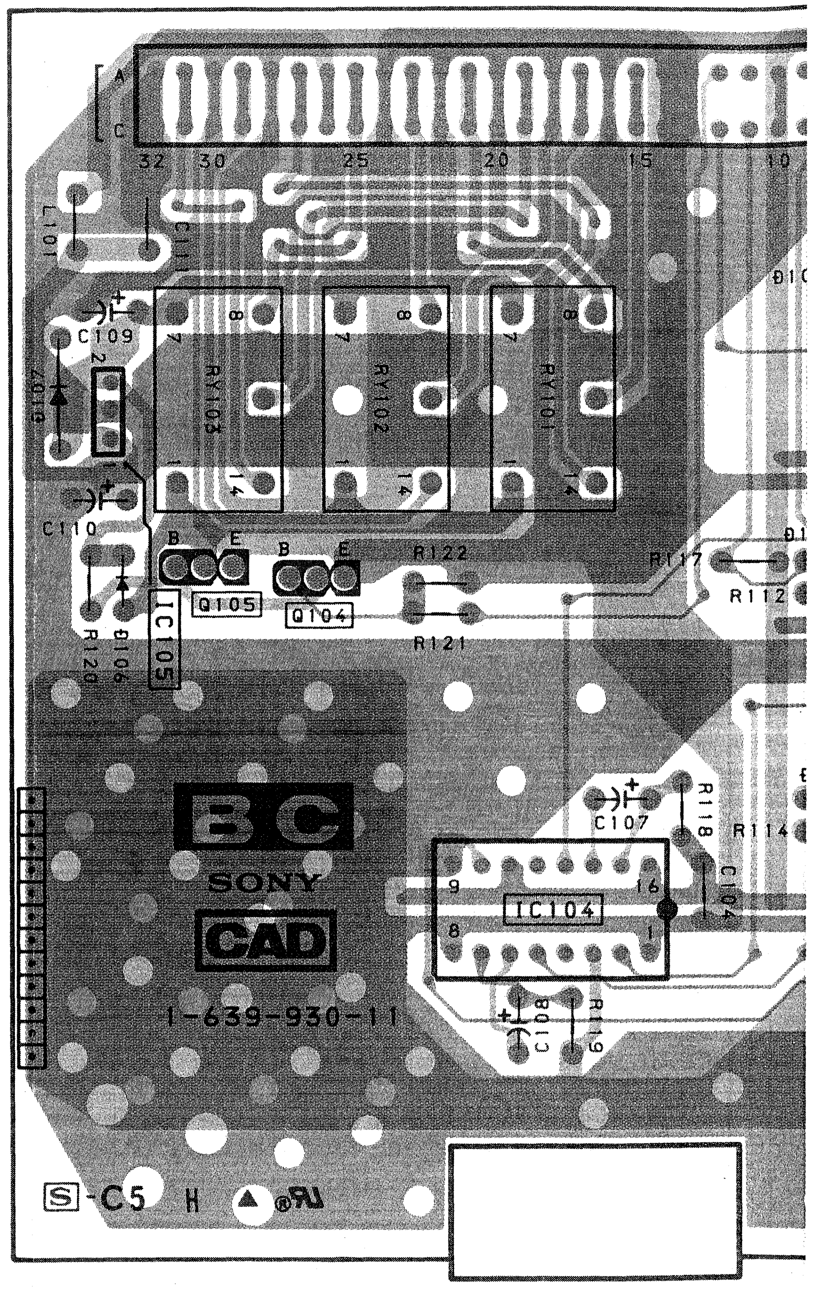

TO DM BOARD DM-28
KA-502 5P WHT :S-MICRO
AUDIO (R)
AUDIO GND
AUDIO+12V
GND
-15.5V
KA-501 2P WHT :S-MICRO
SPEAKER+
SPEAKER-
IC501 µPC1241H
Q502 2SA1175
Q501 2SA1441
D501 V06C
-15V
(AUDIO AMP) KA

L	IC301	TC74HC541AP	DECODER
	302	MC14495P1	DECODER
	303	MC14495P1	DECODER
	304	GL-6R202	DISPLAY
	Q301	2SC2785	BUFF.
	302	2SC2785	BUFF.
	303	2SC2785	BUFF.
	304	2SC2785	BUFF.

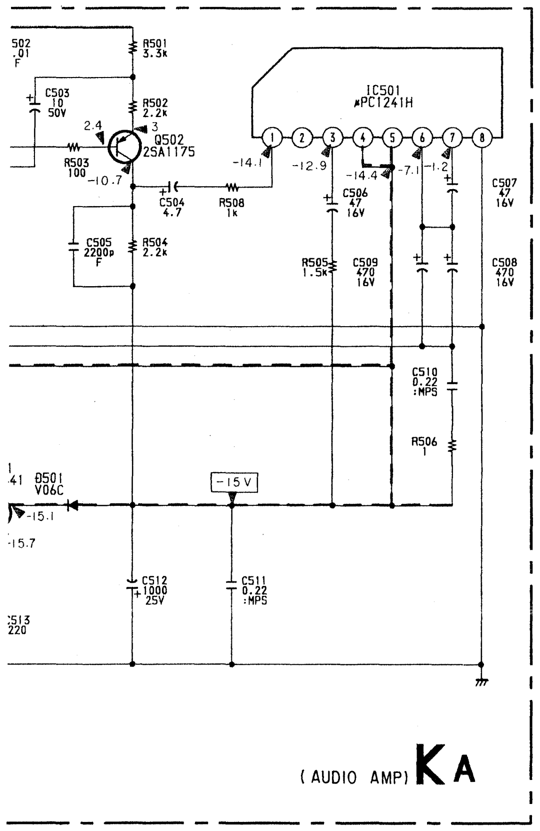
KA	IC501	µPC1241H	AUDIO AMP
	Q501	2SA1441	-15V REG
	502	2SA1175	BUFF
	D501	V06C	-15V REG PROT

BC [SIRCS FILTER & SELECT]

- BC BOARD -


BC
SONY
CAD
1-639-930-11
RY103
RY102
RY101
IC104
IC105
Q105
Q104
C109
C110
C107
C104
R122
R121
R118
R119
R120
R112
R117
R114
L101
S-C5

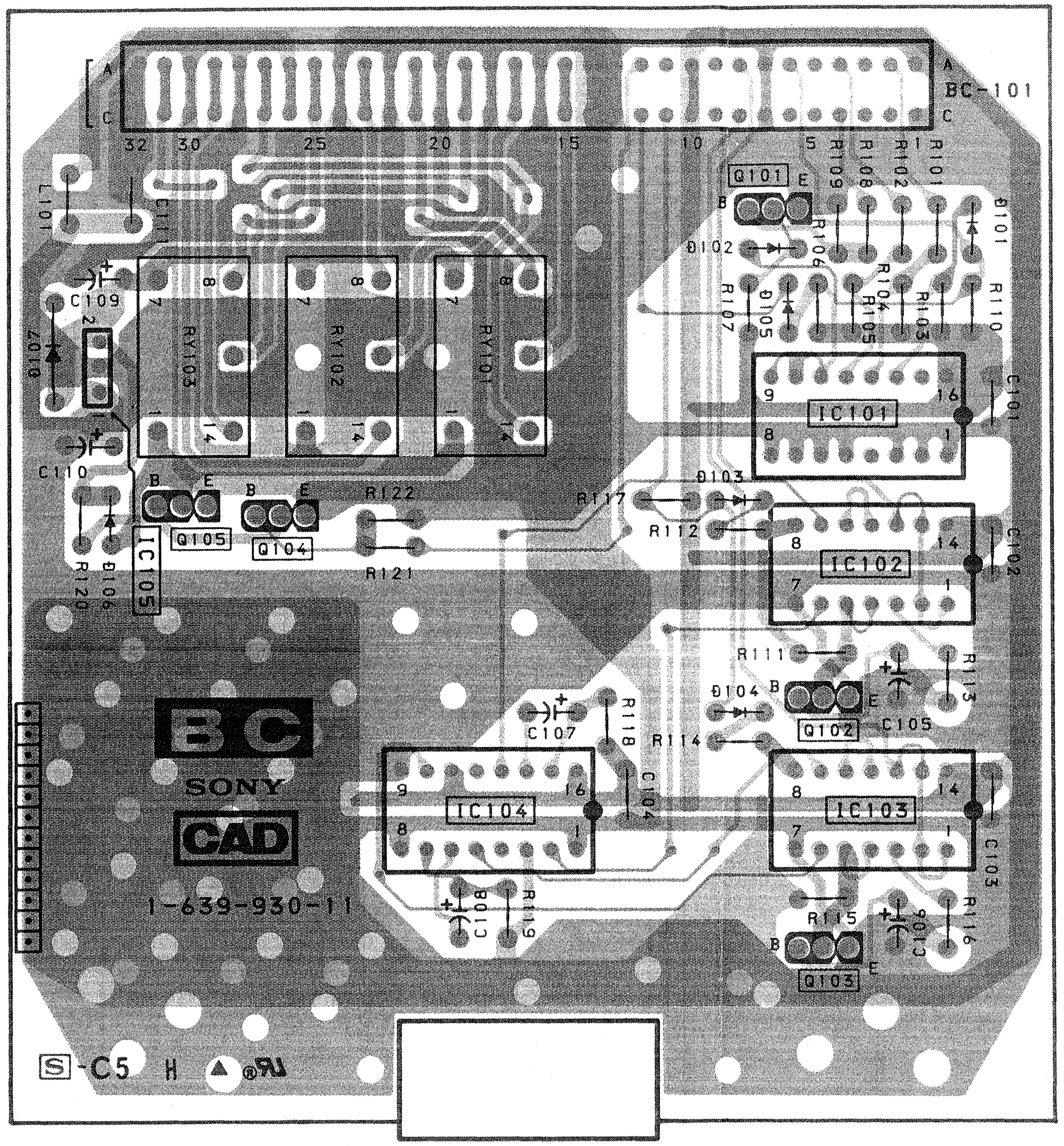
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.


R501 3.3k
C503 10 50V
R502 2.2k
Q502 2SA1175
R503 100
-10.7
IC501 µPC1241H
-14.1
-12.9
-14.4
-7.1
-1.2
C504 4.7
R508 1k
C505 2200p F
R504 2.2k
R505 1.5k
C506 47 16V
C509 470 16V
C507 47 16V
C508 470 16V
C510 0.22 MPS
R506 1
Q501 V06C
-15V
-15.1
-15.7
C512 1000 25V
C511 0.22 MPS
C513 220
(AUDIO AMP) KA

IC501	µPC1241H	AUDIO AMP
Q501	2SA1441	-15V REG
502	2SA1175	BUFF
D501	V06C	-15V REG PROT

BC [SIRCS FILTER & SELECT]

– BC BOARD –

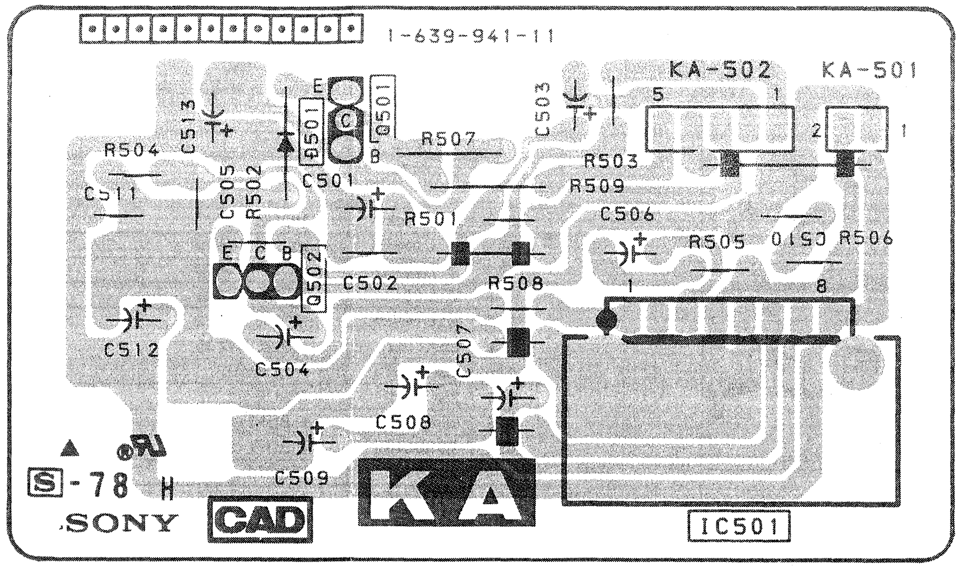

BC-101
A
C
32 30 25 20 15 10 5
L101
C111
C109
D107
RY103
RY102
RY101
C110
Q105
Q104
IC105
R120
D106
R122
R121
Q101
D101
D102
R101 R102 R103 R104 R105 R106 R107 R108 R109 R110
D105
IC101
C101
D103
R117
R112
IC102
C102
R111
D104
Q102
C105
R113
C107
R118
R114
IC104
C104
IC103
C103
C108
R119
R115
C106
R116
Q103
BC
SONY
CAD
1-639-930-11
S-C5 H

- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.

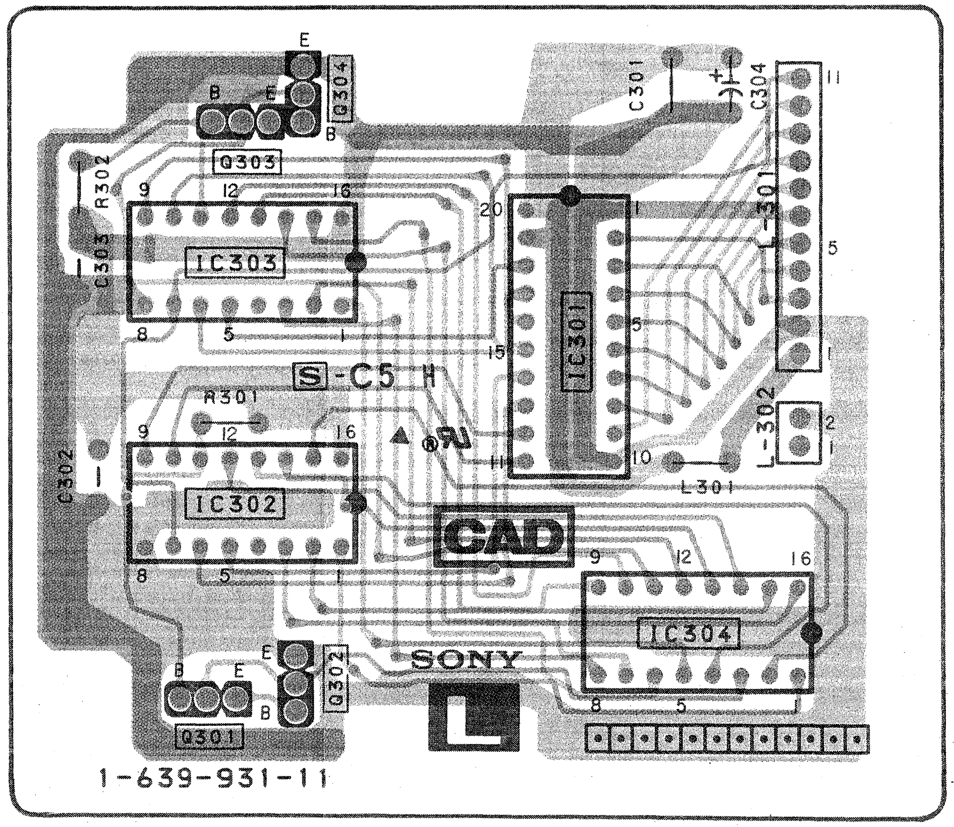
KA [AUDIO AMP]

L [ERROR CODE DISPLAY]

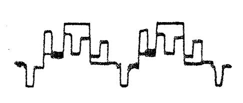
– KA BOARD –


1-639-941-11
KA-502
KA-501
C513
Q501
C503
R504
R507
R503
R509
C511
C505
R502
C501
R501
C506
R505
C510
R506
Q502
C502
R508
C512
C504
C507
C508
C509
S-78 H
SONY
CAD
KA
IC501

– L BOARD –

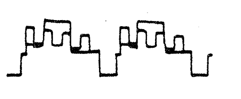

Q304
Q303
C301
C304
R302
C303
IC303
L-301
IC301
S-C5 H
R301
L-302
C302
IC302
L301
CAD
IC304
SONY
L
Q302
Q301
1-639-931-11

①



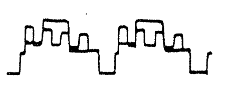
1.4Vp-p (H)

②



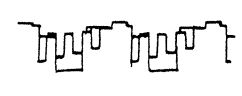
3Vp-p (H)

③



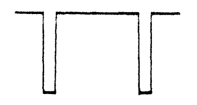
6.4Vp-p (H)

④



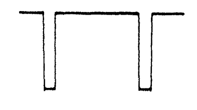
190Vp-p (H)

⑤



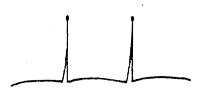
24Vp-p (H)

⑥



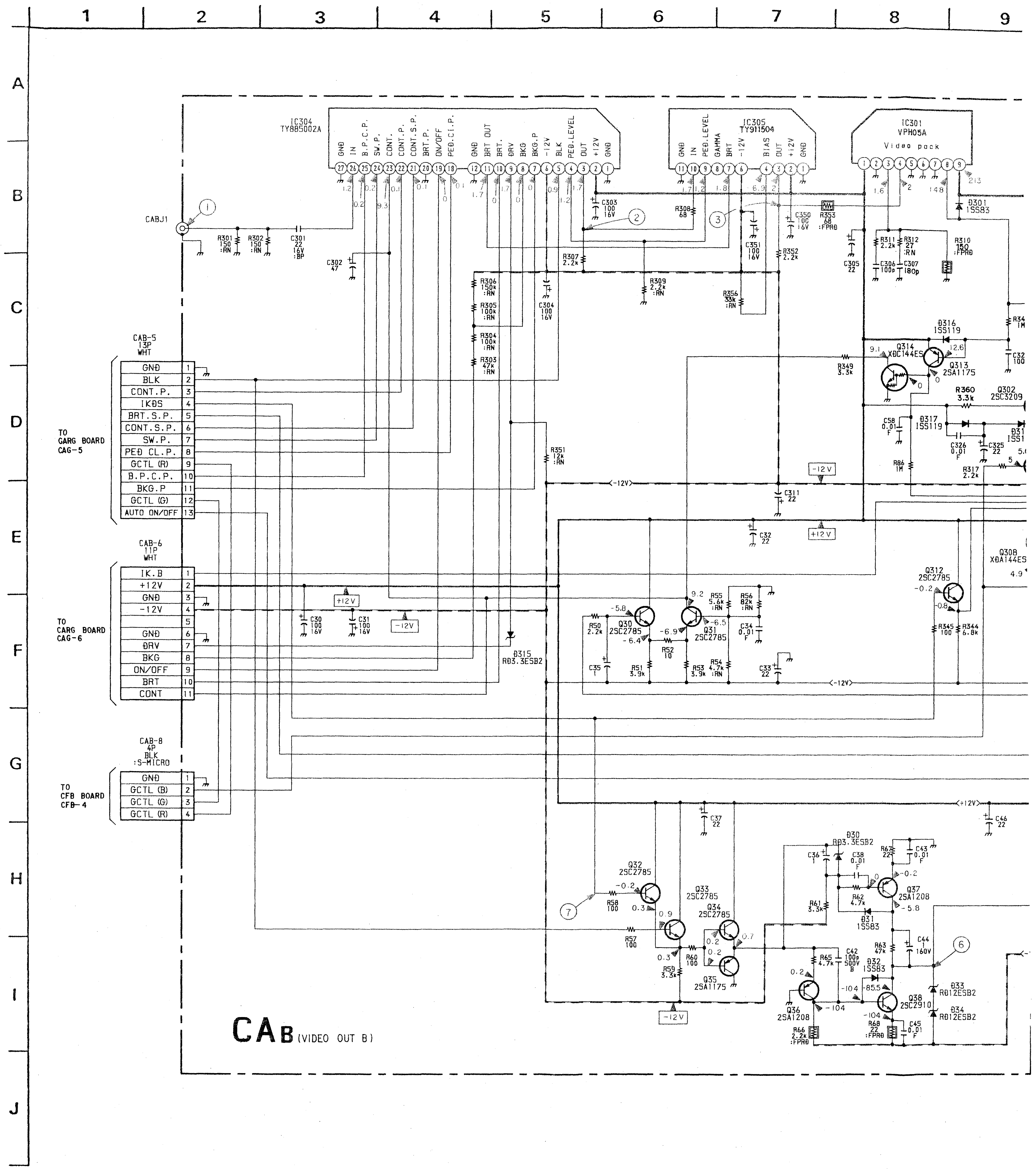
24Vp-p (H)

⑦



5Vp-p (H)

CA (B)	IC301	VPH06	B VIDEO OUT
	302	TL082CP	B AUTO BKG
	304	TY885002A	B SIGNAL PROCESS
	305	TY911504	B γ CORR
	Q30	2SC2785	ΣABL
	31	2SC2785	ΣABL
	32	2SC2785	BLK
	33	2SC2785	BLK
	34	2SC2785	BLK
	35	2SA1175	BLK
	36	2SA1208	BLK
	37	2SA1208	BLK
	38	2SC2910	BLK
	41	2SD982	+210V RIPPLE FILTER
	42	2SA1381	–100V RIPPLE FILTER
	43	2SA1381	+210V CURRENT PROT
	44	2SD982	+B1 RIPPLE FILTER
	45	2SC3209	ON SPOT PROT
	301	2SA1175	B G1 CONT
	302	2SC3209	B G1 CONT
	303	2SA1381	B Iκ DET-1
	304	2SA1381	B CURRENT SOURCE
	305	2SC2785	B Iκ DET-2
	306	2SC3209	B Iκ DET-2
	307	2SA1381	B Iκ DET-2
	308	XDA144ES	B AUTO BKG SW
	309	XDA144ES	B AUTO BKG SW
	310	XDC144ES	B AUTO BKG SW
	311	2SK523	B AUTO BKG
	312	2SC2785	B Iκ DET-2
	313	2SA1175	B SWING PROT
	314	XDC144ES	B SWING PROT
	315	2SA1381	B G1 CONT
	D30	RD3.3ESB2	BLK
	31	1SS83	BLK
	32	1SS83	BLK
	33	RD12ESB2	BLK
	34	RD12ESB2	BLK
	35	V06C	+210V RIPPLE FILTER PROT
	36	V06C	–100V RIPPLE FILTER PROT
	40	V06C	+B1 RIPPLE FILTER PROT
	41	1SS119	ON SPOT PROT
	301	1SS83	B VIDEO OUT PROT
	303	1SS119	B Iκ DET-1 PROT
	304	1SS119	B THERM COMP
	305	1SS83	B Iκ DET-2 PROT
	306	1SS119	B Iκ DET-2 PROT
	307	1SS119	B Iκ DET-2 PROT
	309	1SS119	B Iκ DET-2 PROT
	310	RD2.0ESB2	B Iκ DET-2 PROT
	311	1SS119	B Iκ DET-2 PROT
	312	1SS119	B AUTO BKG SW
	313	1SS119	B THERM COMP
	314	RD13ESB2	B Iκ DET-1 PROT
	315	RD3.3ESB2	B DRV
	316	1SS119	B SWING PROT
	317	1SS119	B OFF SPOT PROT
	318	1SS119	B OFF SPOT PROT


1
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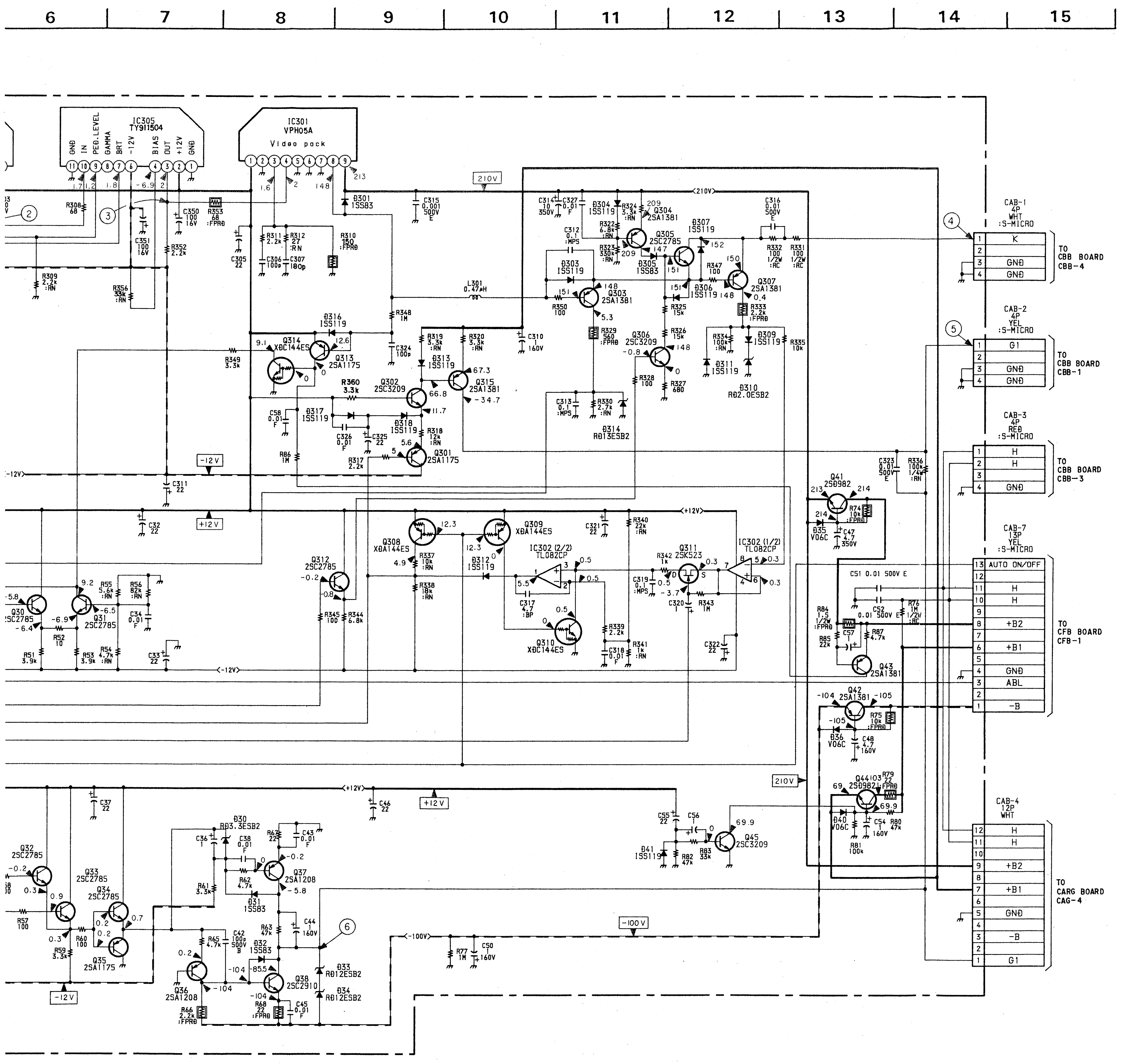
A
B
C
D
E
F
G
H
I
J
IC304 TY885002A
IC305 TY911504
IC301 VPH05A
Video pack
CABJ1
CAB-5 13P WHT
TO GARG BOARD CAG-5
GND
BLK
CONT.P.
IKBS
BRT.S.P.
CONT.S.P.
SW.P.
PED CL.P.
GCTL (R)
B.P.C.P.
BKG.P
GCTL (G)
AUTO ON/OFF
CAB-6 11P WHT
TO CARG BOARD CAG-6
IK.B
+12V
GND
-12V
BRV
BKG
ON/OFF
BRT
CONT
CAB-8 4P BLK :S-MICRO
TO CFB BOARD CFB-4
GCTL (B)
GCTL (G)
GCTL (R)
Q30 2SC2785
Q31 2SC2785
Q32 2SC2785
Q33 2SC2785
Q34 2SC2785
Q35 2SA1175
Q36 2SA1208
Q37 2SA1208
Q38 2SC2910
D30 RD3.3ESB2
D31 1SS83
D32 1SS83
D33 RD12ESB2
D34 RD12ESB2
Q312 2SC2785
Q313 2SA1175
Q314 XDC144ES
Q302 2SC3209
Q308 XDA144ES
D301 1SS83
D315 RD3.3ESB2
D316 1SS119
D317 1SS119
+12V
-12V

CAB (VIDEO OUT B)


6
7
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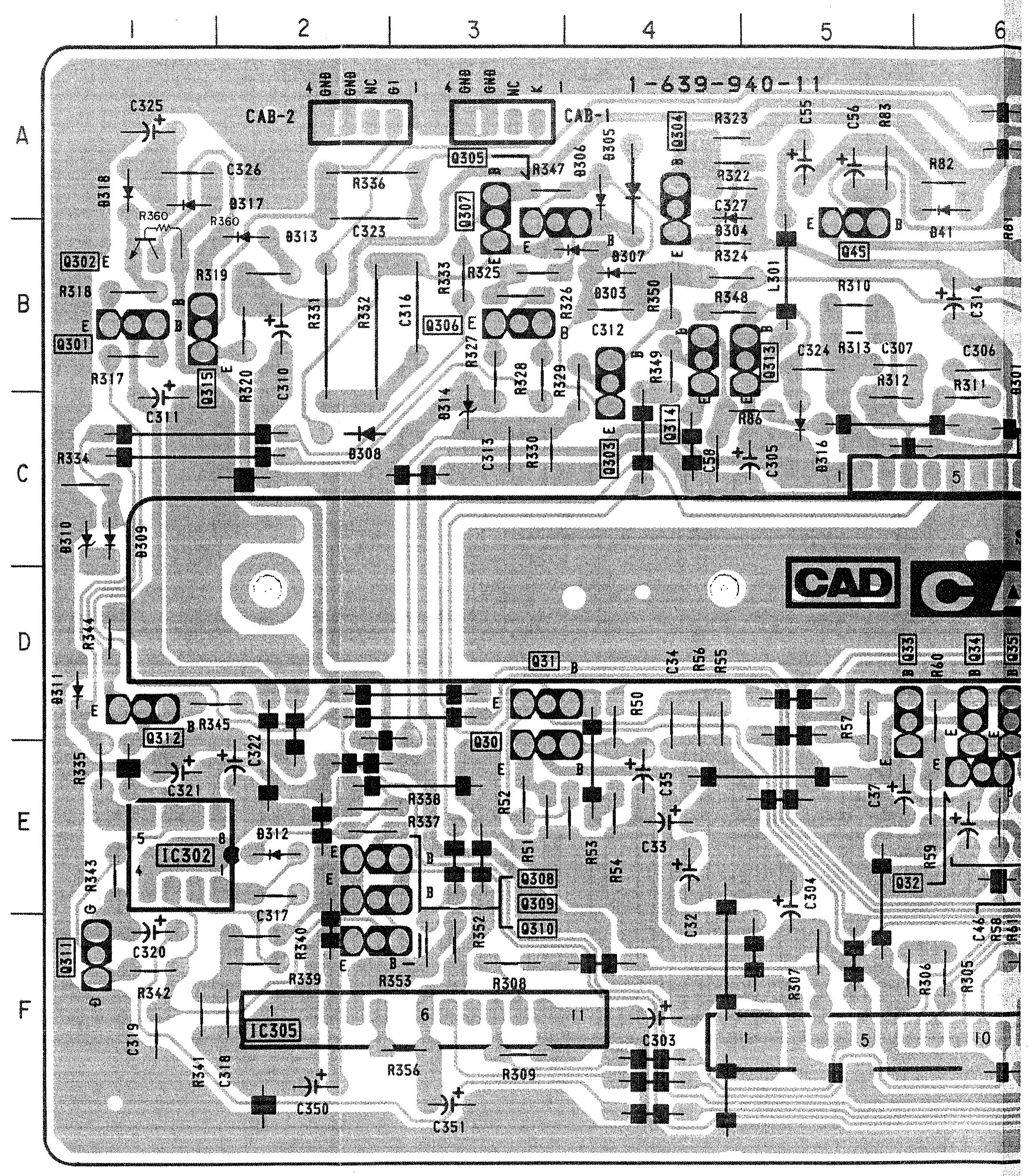
11
12
13
14
15
IC305 TY911504
GND
IN
PED.LEVEL
GAMMA
BRT
-12V
BIAS
OUT
+12V
GND
IC301 VPH05A
Video pack
210V
CAB-1 4P WHT :S-MICRO
K
GND
GND
TO CBB BOARD CBB-4
CAB-2 4P YEL :S-MICRO
G1
GND
GND
TO CBB BOARD CBB-1
CAB-3 4P RED :S-MICRO
H
H
GND
TO CBB BOARD CBB-3
CAB-7 13P YEL :S-MICRO
AUTO ON/OFF
H
H
+B2
+B1
GND
ABL
-B
TO CFB BOARD CFB-1
CAB-4 12P WHT
H
H
+B2
+B1
GND
-B
G1
TO CARG BOARD CAG-4
Q301 2SA1175
Q302 2SC3209
Q303 2SA1381
Q304 2SA1381
Q305 2SC2785
Q306 2SC3209
Q307 2SA1381
Q308 XBA144ES
Q309 XBA144ES
Q310 XBC144ES
Q311 2SK523
Q312 2SC2785
Q313 2SA1175
Q314 XBC144ES
Q315 2SA1381
IC302 (1/2) TL082CP
IC302 (2/2) TL082CP
Q30 2SC2785
Q31 2SC2785
Q32 2SC2785
Q33 2SC2785
Q34 2SC2785
Q35 2SA1175
Q36 2SA1208
Q37 2SA1208
Q38 2SC2910
Q41 2SD982
Q42 2SA1381
Q43 2SA1381
Q44 2SD982
Q45 2SC3209
+12V
-12V
-100V

CA(B)

[VIDEO OUT B]

– CA(B) BOARD –


1
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A
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C
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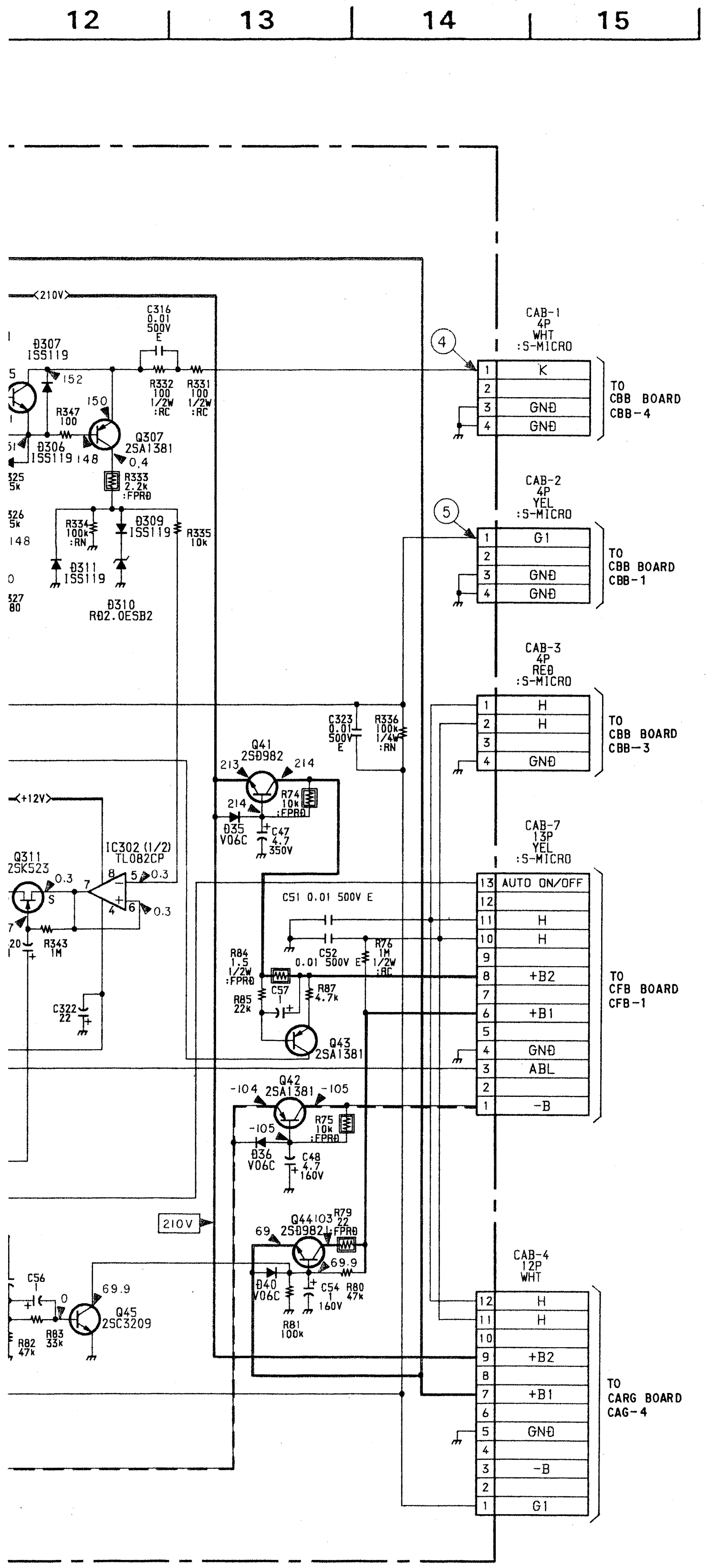
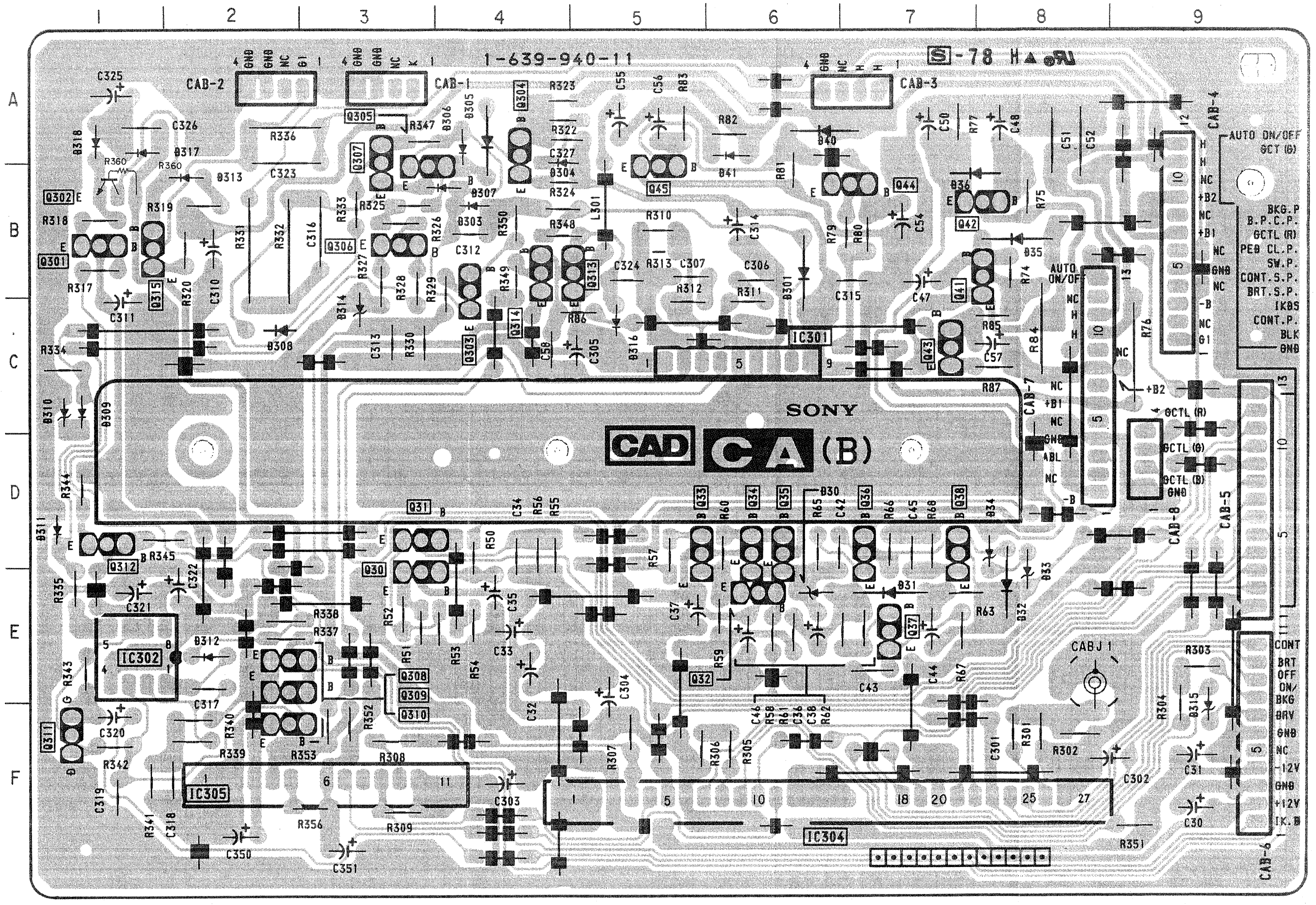
E
F
1-639-940-11
CAB-2
CAB-1
CAD
IC302
IC305

CA(B) [VIDEO OUT B]


12
13
14
15
CAB-1 4P WHT :S-MICRO
K
GND
GND
TO CBB BOARD CBB-4
CAB-2 4P YEL :S-MICRO
G1
GND
GND
TO CBB BOARD CBB-1
CAB-3 4P RED :S-MICRO
H
H
GND
TO CBB BOARD CBB-3
CAB-7 13P YEL :S-MICRO
AUTO ON/OFF
H
H
+B2
+B1
GND
ABL
-B
TO CFB BOARD CFB-1
CAB-4 12P WHT
H
H
+B2
+B1
GND
-B
G1
TO CARG BOARD CAG-4
IC302 (1/2) TL082CP
Q307 2SA1381
Q311 2SK523
Q41 2SD982
Q42 2SA1381
Q43 2SA1381
Q44 2SD982
Q45 2SC3209
210V
+12V

- CA(B) BOARD -


1
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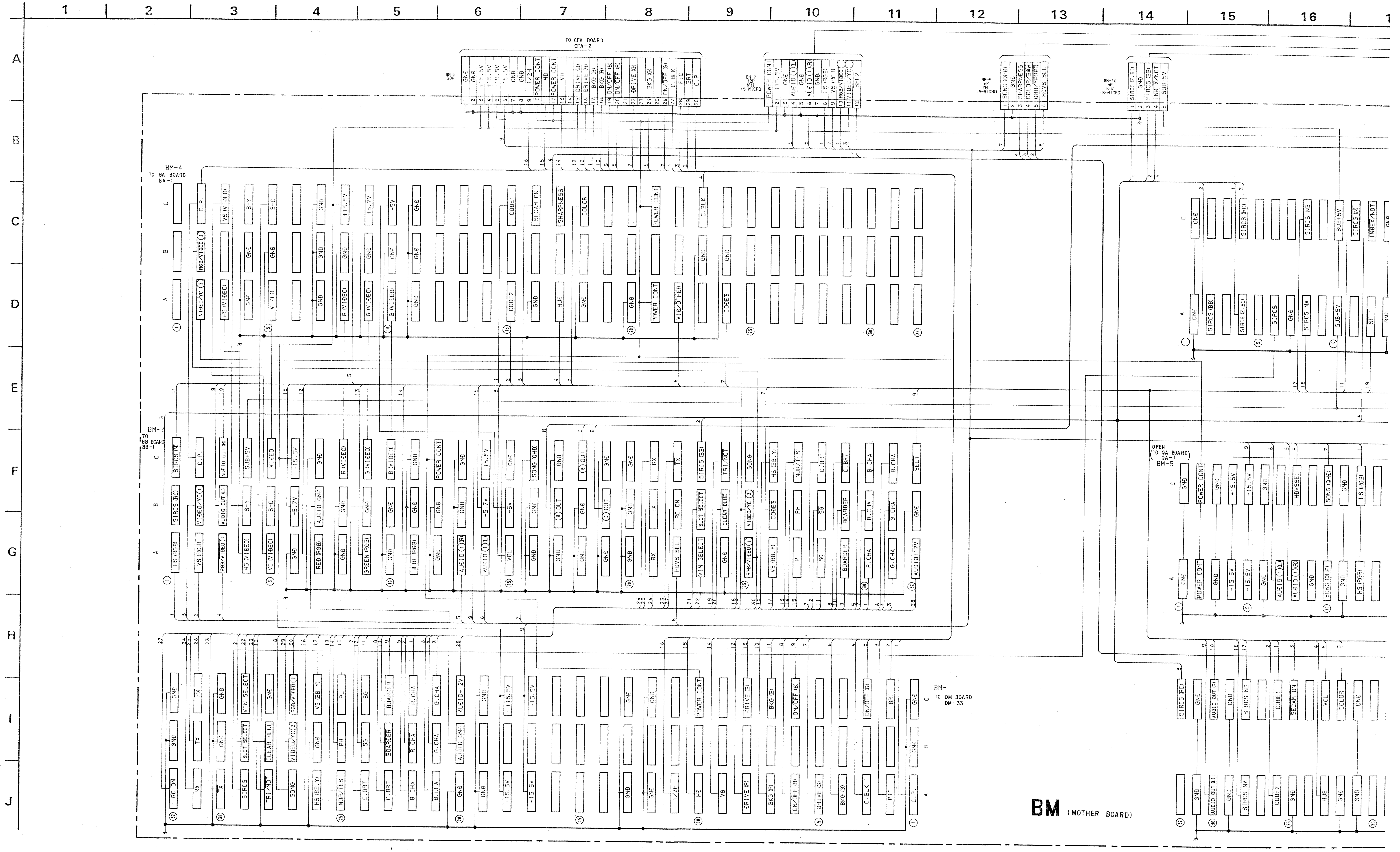
A
B
C
D
E
F
1-639-940-11
CAB-1
CAB-2
CAB-3
CAB-4
CAB-5
CAB-6
CAB-7
CAB-8
CABJ1
IC301
IC302
IC304
IC305
SONY
CAD
CA (B)
AUTO ON/OFF
BKG.P
B.P.C.P.
GCTL (R)
PEB CL.P.
SW.P.
CONT.S.P.
BRT.S.P.
IKBS
CONT.P.
BLK
GND
CONT
BRT
OFF
ON/
BKG
BRV
GND
NC
-12V
GND
+12V
IK.B

IC	
IC301	C-6
IC302	E-1
IC304	F-6
IC305	F-2

TRANSISTOR	
Q30	E-3
Q31	D-3
Q32	E-6
Q33	D-5
Q34	D-6
Q35	D-6
Q36	D-7
Q37	E-7
Q38	D-7
Q41	B-7
Q42	B-7
Q43	C-7
Q44	B-7
Q45	B-5
Q301	B-1
Q302	B-1
Q303	C-4
Q304	A-4
Q305	A-3
Q306	B-3
Q307	A-3
Q308	E-2
Q309	E-2
Q310	F-2
Q311	F-1
Q312	D-1
Q313	B-5
Q314	B-4
Q315	B-1

DIODE	
D30	E-6
D31	E-7
D32	E-8
D33	E-8
D34	D-8
D35	B-8
D36	B-7
D40	A-6
D41	A-6
D301	B-6
D303	B-4
D304	B-4
D305	A-4
D306	A-4
D307	B-4
D309	C-1
D310	C-1
D311	D-1
D312	E-2
D313	B-2
D314	C-3
D315	F-9
D316	C-5
D317	A-1
D318	A-1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A
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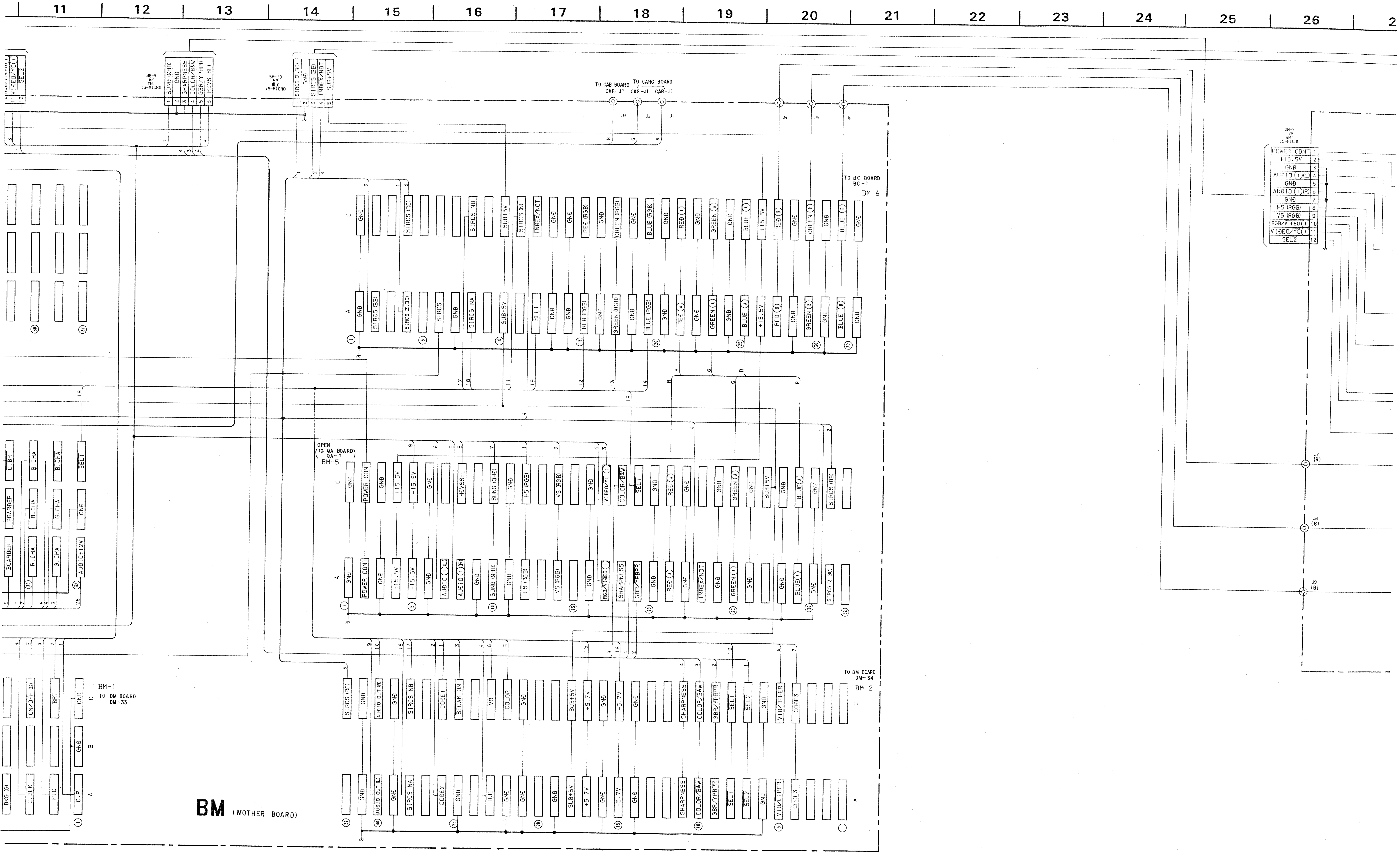
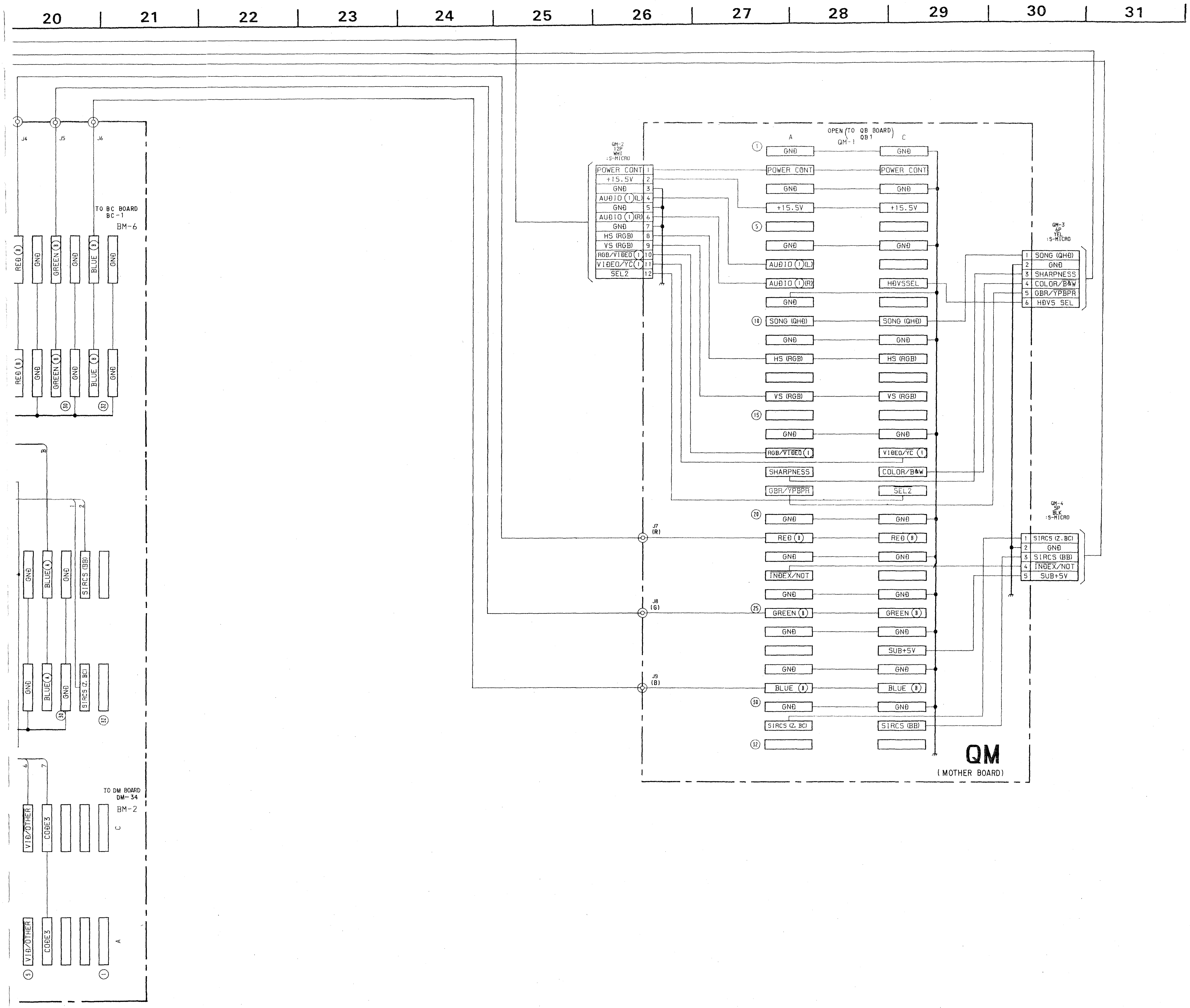
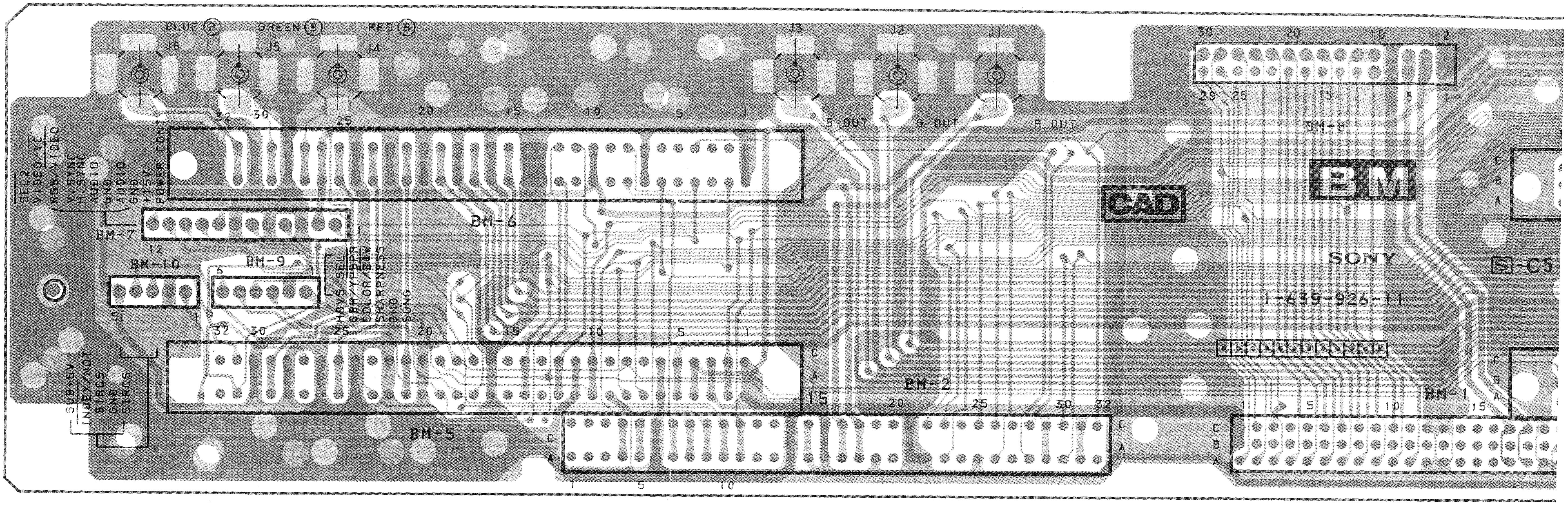
C
D
E
F
G
H
I
J
TO CFA BOARD
CFA-2
BM-8
30P
GND
+15.5V
-15.5V
1/2H
POWER CONT
HD
VD
DRIVE (B)
DRIVE (R)
BKG (B)
BKG (R)
ON/OFF (B)
ON/OFF (R)
DRIVE (G)
BKG (G)
ON/OFF (G)
C.BLK
PIC
BRT
C.P.
BM-7
12P
WHT
:S-MICRO
AUDIO (L)
AUDIO (R)
HS (RGB)
VS (RGB)
RGB/VIDEO
VIDEO/YC
SEL2
BM-9
6P
:S-MICRO
SONG (QHD)
SHARPNESS
COLOR/B&W
QBR/YPBPR
HDVS SEL
BM-10
5P
BLK
:S-MICRO
SIRCS (Z.BC)
SIRCS (BB)
INDEX/NOT
SUB+5V
BM-4
TO BA BOARD
BA-1
C.P.
VS (VIDEO)
S-Y
S-C
+15.5V
+5.7V
-5V
CODE1
SECAM ON
SHARPNESS
COLOR
POWER CONT
C.BLK
RGB/VIDEO
VIDEO/YC
HS (VIDEO)
VIDEO
R (VIDEO)
G (VIDEO)
B (VIDEO)
CODE2
HUE
VID/OTHER
CODE3
BM-3
TO BB BOARD
BB-1
SIRCS (N)
AUDIO OUT (R)
SUB+5V
SIRCS (RC)
AUDIO OUT (L)
-15.5V
SONG (QHD)
(R) OUT
(G) OUT
(B) OUT
RX
TX
RC ON
SIRCS (BB)
TRI/NOT
SONG
HS (BB.Y)
NOR/TEST
C.BRT
B.CHA
SEL1
AUDIO GND
-5.7V
SLOT SELECT
CLEAR BLUE
CODE3
PH
SG
BOARDER
R.CHA
G.CHA
RED (RGB)
GREEN (RGB)
BLUE (RGB)
VOL
HDVS SEL
VIN SELECT
VS (BB.Y)
PL
AUDIO+12V
OPEN
(TO QA BOARD)
QA-1
BM-5
HD/SEL
SIRCS NB
SIRCS NA
SEL1
BM-1
TO DM BOARD
DM-33
BM (MOTHER BOARD)

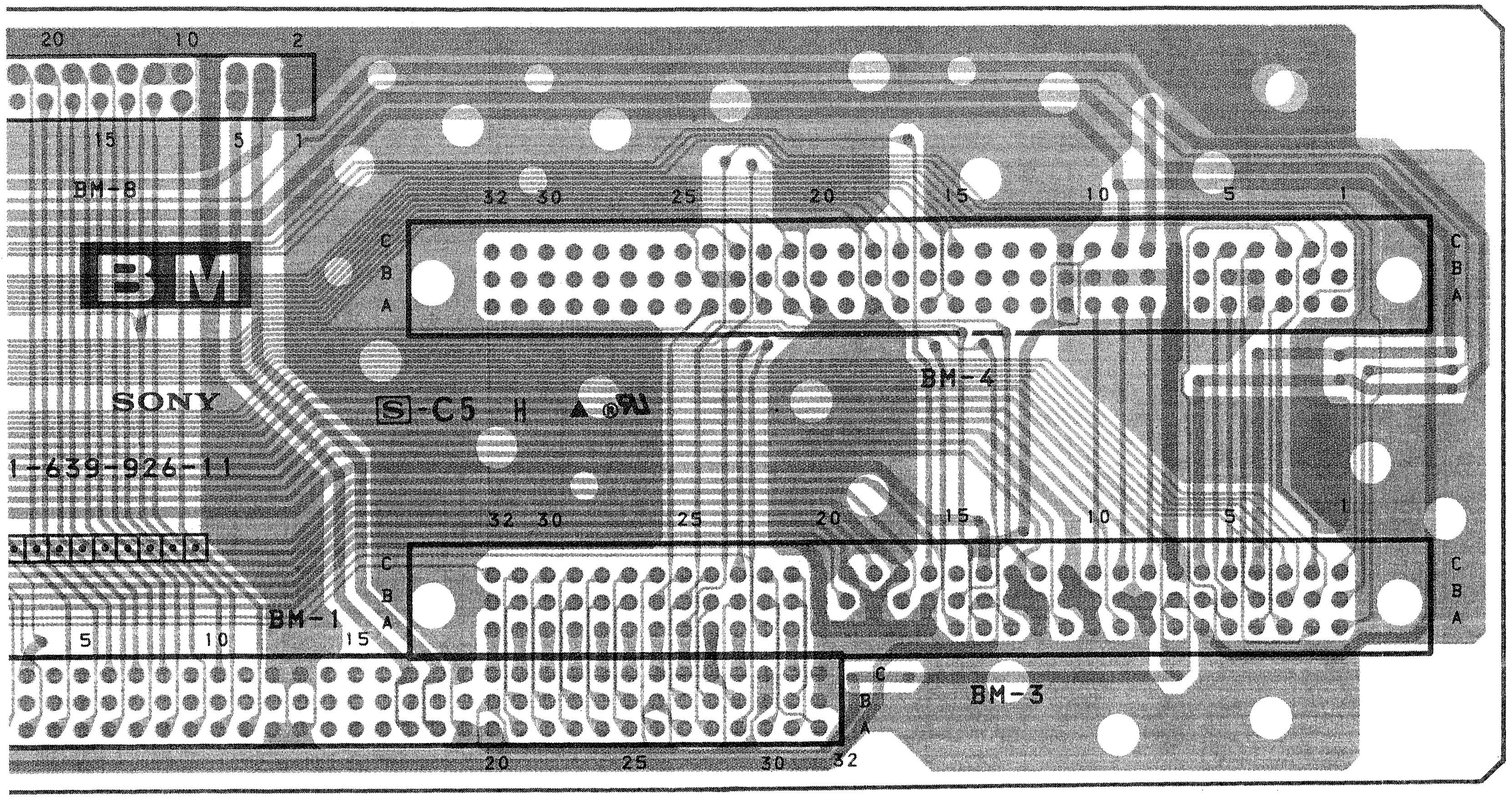

11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
BM-9 8P YEL :S-MICRO
SYNC (Q.HD)
GND
SHARPNESS
COLOR/B&W
GBR/YPBPR
HDVS SEL
BM-10 5P BLK :S-MICRO
SIRCS (Z.BC)
GND
SIRCS (BB)
INDEX/NOT
SUB+5V
TO CAB BOARD CAB-J1
TO CARG BOARD CAG-J1 CAR-J1
J1
J2
J3
J4
J5
J6
J7 (R)
J8 (G)
J9 (B)
TO BC BOARD BC-1
BM-6
BM-2 12P WHT :S-MICRO
POWER CONT
+15.5V
GND
AUDIO (L)
AUDIO (R)
HS (RGB)
VS (RGB)
RGB/VIDEO
VIDEO/YC
SEL2
SIRCS (RC)
SIRCS NB
SUB+5V
SIRCS (N)
INDEX/NOT
RED (RGB)
GREEN (RGB)
BLUE (RGB)
RED (A)
GREEN (A)
BLUE (A)
RED (B)
GREEN (B)
BLUE (B)
SIRCS (BB)
SIRCS (Z.BC)
SIRCS
SIRCS NA
SEL1
OPEN (TO QA BOARD) QA-1
BM-5
-15.5V
HDVSSEL
COLOR/B&W
SHARPNESS
GBR/YPBPR
C.BRT
B.CHA
BOARDER
R.CHA
G.CHA
AUDIO+12V
BM-1
TO DM BOARD DM-33
ON/OFF (G)
BRT
BKG (G)
C.BLK
PIC
C.P.
AUDIO OUT (R)
AUDIO OUT (L)
CODE1
CODE2
SECAM ON
VOL
COLOR
HUE
+5.7V
-5.7V
SEL2
VID/OTHER
CODE3
TO DM BOARD DM-34
BM-2
BM (MOTHER BOARD)


20
21
22
23
24
25
26
27
28
29
30
31
J4
J5
J6
TO BC BOARD
BC-1
BM-6
RED (B)
GND
GREEN (B)
GND
BLUE (B)
GND
RED (B)
GND
GREEN (B)
GND
BLUE (B)
GND
30
32
B
1
2
GND
BLUE (4)
GND
SIRCS (BB)
GND
BLUE (4)
GND
SIRCS (Z.BC)
30
32
6
7
TO DM BOARD
DM-34
BM-2
C
VID/OTHER
CODE3
VID/OTHER
CODE3
A
5
1
QM-2
12P
WHT
:S-MICRO
POWER CONT 1
+15.5V 2
GND 3
AUDIO (1)(L) 4
GND 5
AUDIO (1)(R) 6
GND 7
HS (RGB) 8
VS (RGB) 9
RGB/VIDEO (1) 10
VIDEO/YC (1) 11
SEL2 12
OPEN (TO QB BOARD QB1)
QM-1
A
C
①
GND
GND
POWER CONT
POWER CONT
GND
GND
+15.5V
+15.5V
⑤
GND
GND
AUDIO (1)(L)
AUDIO (1)(R)
HDVSSEL
GND
⑩
SONG (QHD)
SONG (QHD)
GND
GND
HS (RGB)
HS (RGB)
VS (RGB)
VS (RGB)
⑮
GND
GND
RGB/VIDEO (1)
VIDEO/YC (1)
SHARPNESS
COLOR/B&W
GBR/YPBPR
SEL2
⑳
GND
GND
J7
(R)
RED (B)
RED (B)
GND
GND
INDEX/NOT
GND
GND
J8
(G)
㉕
GREEN (B)
GREEN (B)
GND
GND
SUB+5V
GND
GND
J9
(B)
BLUE (B)
BLUE (B)
30
GND
GND
SIRCS (Z.BC)
SIRCS (BB)
32
QM-3
6P
YEL
:S-MICRO
1 SONG (QHD)
2 GND
3 SHARPNESS
4 COLOR/B&W
5 GBR/YPBPR
6 HDVS SEL
QM-4
5P
BLK
:S-MICRO
1 SIRCS (Z.BC)
2 GND
3 SIRCS (BB)
4 INDEX/NOT
5 SUB+5V
QM
(MOTHER BOARD)

BM [MOTHER BOARD]

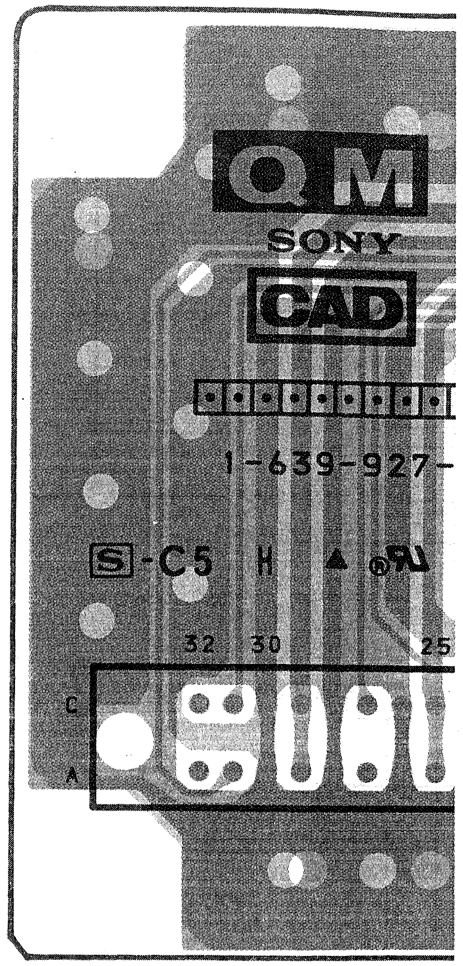
– **BM BOARD** –

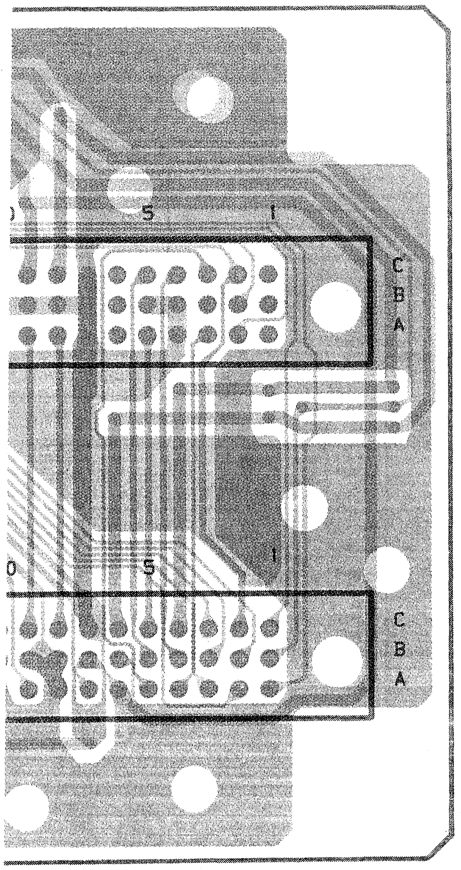

BLUE Ⓑ
GREEN Ⓑ
RED Ⓑ
J6
J5
J4
J3
J2
J1
B OUT
G OUT
R OUT
SEL2
VIDEO/YC
RGB/VIDEO
V.SYNC
H.SYNC
AUDIO
GND
AUDIO
GND
+15V
POWER CONT
BM-7
12
1
BM-10
5
1
BM-9
6
1
HDVS SEL
GBR/YPBPR
COLOR/B&W
SHARPNESS
GND
SONG
SUB+5V
INDEX/NOT
SIRCS
GND
SIRCS
BM-6
BM-5
BM-2
BM-8
BM-1
C
B
A
CAD
BM
SONY
1-639-926-11
S-C5
32
30
25
20
15
10
5
1
29
2


BM
SONY
1-639-926-11
BM-8
BM-4
BM-1
BM-3
S-C5 H

QM [MOTHER BOARD]

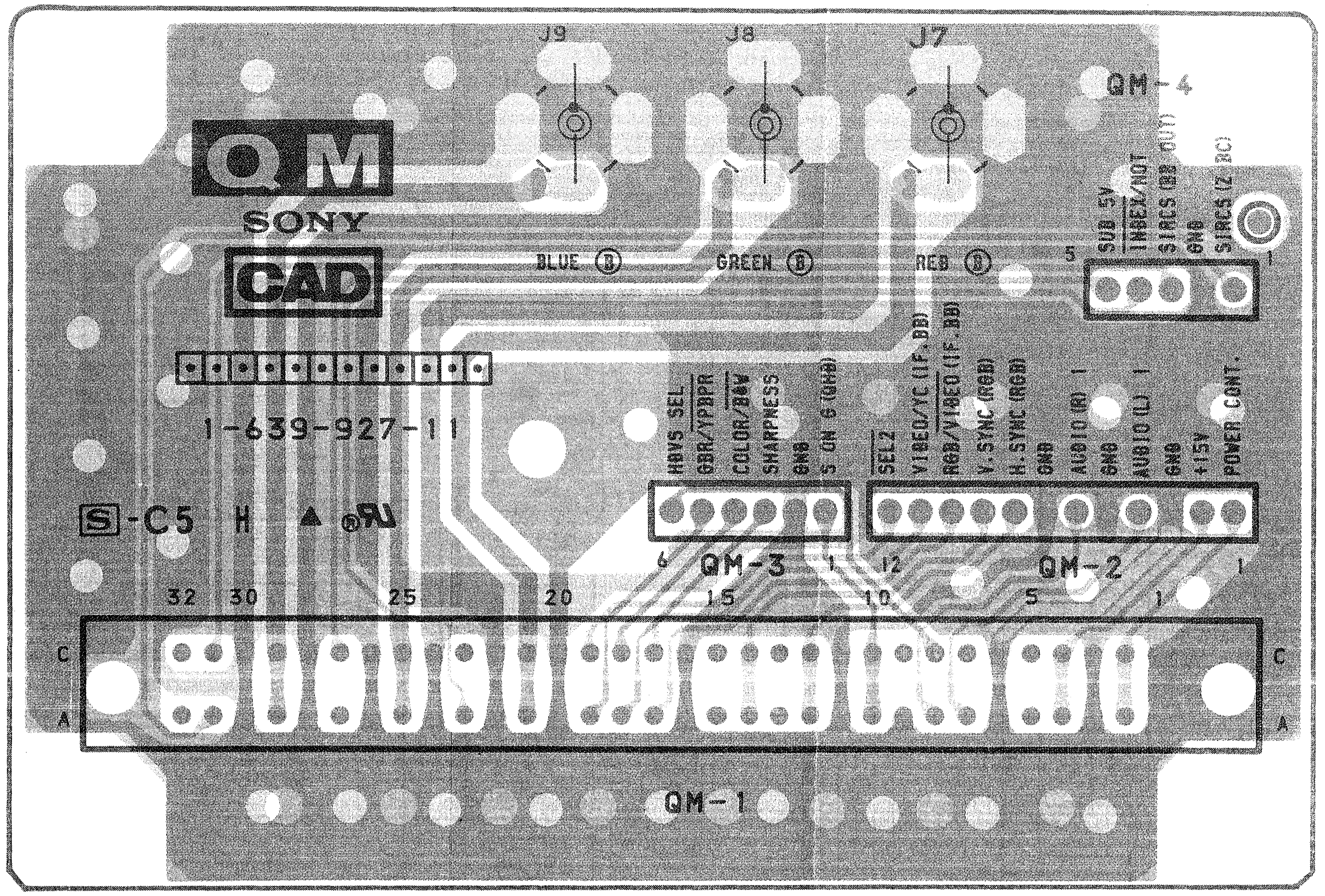
– QM BOARD –


QM
SONY
CAD
1-639-927-
S-C5 H

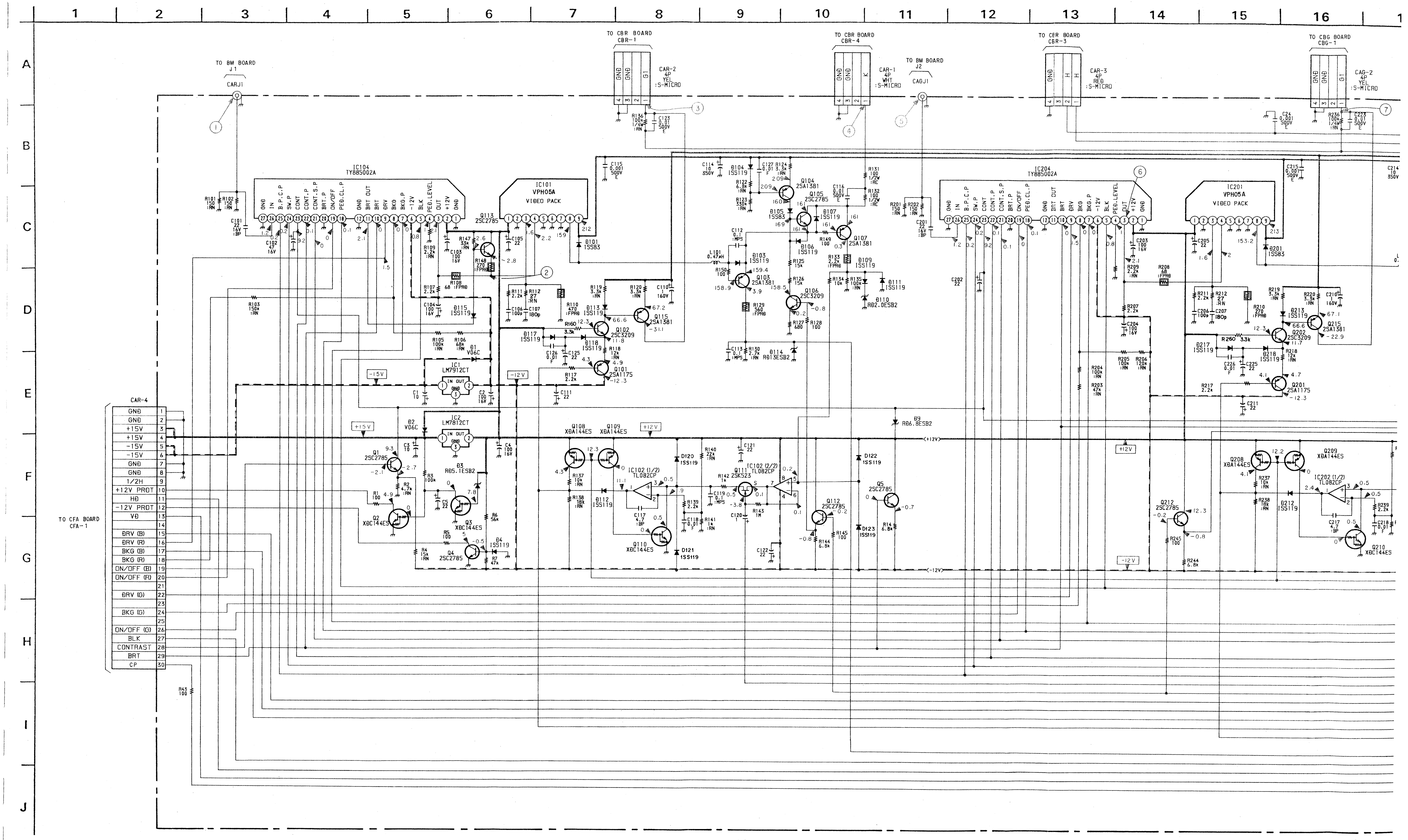

5
1
C
B
A
0
5
1
C
B
A

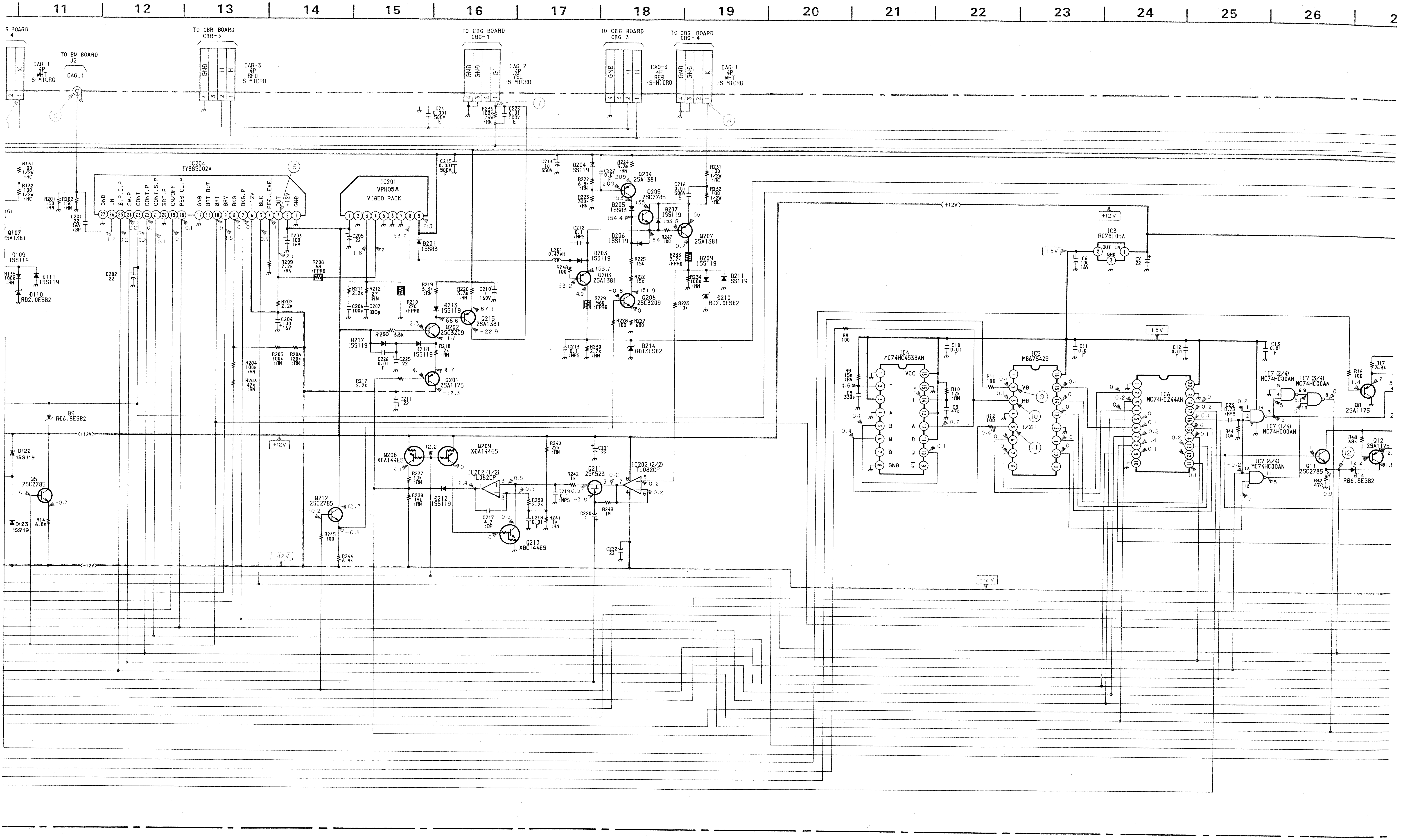
QM [MOTHER BOARD]

– QM BOARD –


J9
J8
J7
QM-4
QM
SONY
CAD
BLUE Ⓑ
GREEN Ⓑ
RED Ⓑ
5
SUB 5V
INDEX/NOT
SIRCS (BB OUT)
GND
SIRCS (Z RC)
1
1-639-927-11
HDVS SEL
GBR/YPBPR
COLOR/B&W
SHARPNESS
GND
S ON 6 (GND)
SEL2
VIDEO/YC (IF. BD)
RGB/VIDEO (IF. BD)
V. SYNC (RGB)
H. SYNC (RGB)
GND
AUDIO (R) 1
GND
AUDIO (L) 1
GND
+15V
POWER CONT.
S-C5 H
6
QM-3
1
12
QM-2
1
32
30
25
20
15
10
5
1
C
A
C
A
QM-1

- ▒ : Pattern from the side which enables seeing.
- ▒ : Pattern of the rear side.


TO BM BOARD
J1
CARJ1
TO CBR BOARD
CBR-1
CAR-2
4P
YEL
:S-MICRO
TO CBR BOARD
CBR-4
CAR-1
4P
WHT
:S-MICRO
TO BM BOARD
J2
CAGJ1
TO CBR BOARD
CBR-3
CAR-3
4P
RED
:S-MICRO
TO CBG BOARD
CBG-1
CAG-2
4P
YEL
:S-MICRO
IC104
TY885002A
IC101
VPH05A
VIDEO PACK
IC204
TY885002A
IC201
VPH05A
VIDEO PACK
GND
IN
B.P.C.P
SW.P
CONT
CONT.P
CONT.S.P
BRT.P
ON/OFF
PED.CL.P
GND
BRT
BRT OUT
DRV
BKG
BKG.P
-12V
BLK
PED.LEVEL
OUT
+12V
IC1
LM7912CT
IC2
LM7812CT
IN
OUT
-15V
+15V
-12V
+12V
IC102 (1/2)
TL082CP
IC102 (2/2)
TL082CP
IC202 (1/2)
TL082CP
CAR-4
TO CFA BOARD
CFA-1
1 GND
2 GND
3 +15V
4 +15V
5 -15V
6 -15V
7 GND
8 GND
9 1/2H
10 +12V PROT
11 HD
12 -12V PROT
13 VD
14
15 DRV (B)
16 DRV (R)
17 BKG (B)
18 BKG (R)
19 ON/OFF (B)
20 ON/OFF (R)
21
22 DRV (G)
23
24 BKG (G)
25
26 ON/OFF (G)
27 BLK
28 CONTRAST
29 BRT
30 CP


11
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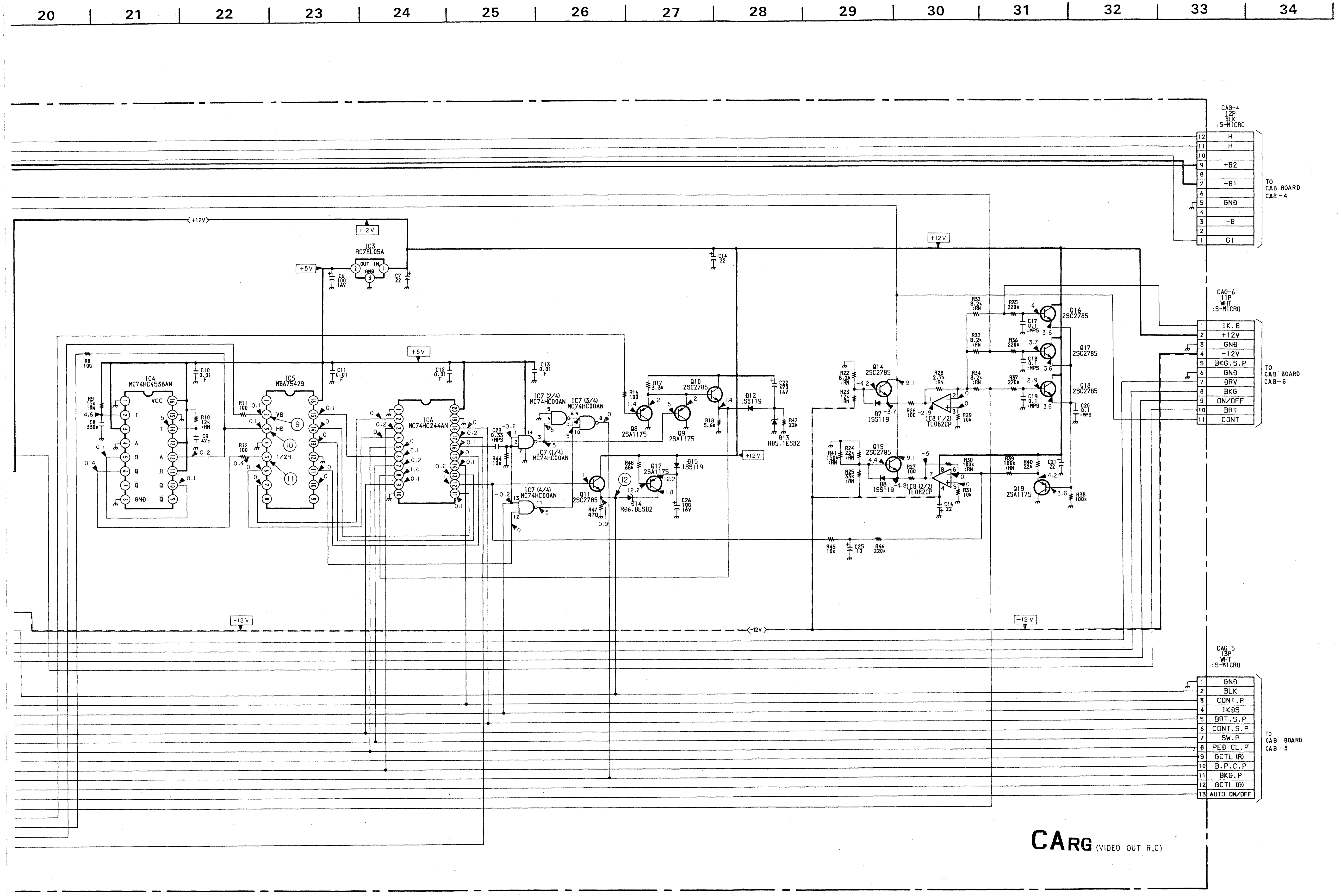
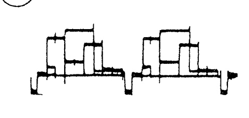
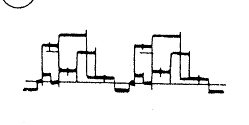
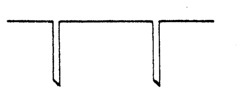
21
22
23
24
25
26
TO BM BOARD J2
CAGJ1
CAR-1 4P WHT :S-MICRO
TO CBR BOARD CBR-3
CAR-3 4P RED :S-MICRO
TO CBG BOARD CBG-1
CAG-2 4P YEL :S-MICRO
TO CBG BOARD CBG-3
CAG-3 4P RED :S-MICRO
TO CBG BOARD CBG-4
CAG-1 4P WHT :S-MICRO
IC204 TY8B5002A
IC201 VPH05A VIDEO PACK
IC202 (1/2) TL082CP
IC202 (2/2) TL082CP
IC3 RC78L05A
IC4 MC74HC4538AN
IC5 MB675429
IC6 MC74HC244AN
IC7 (1/4) MC74HC00AN
IC7 (2/4) MC74HC00AN
IC7 (3/4) MC74HC00AN
IC7 (4/4) MC74HC00AN
Q107 2SA1381
Q5 2SC2785
Q201 2SA1175
Q202 2SC3209
Q203 2SA1381
Q204 2SA1381
Q205 2SC2785
Q206 2SC3209
Q207 2SA1381
Q208 XBA144ES
Q209 XBA144ES
Q210 XBC144ES
Q211 2SK523
Q212 2SC2785
Q215 2SA1381
Q8 2SA1175
Q11 2SC2785
Q12 2SA1175
+12V
-12V
+5V
1/2H
VD
HD
⑥
⑦
⑧
⑨
⑩
⑪
⑫

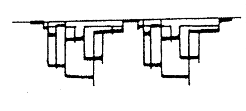

20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
+12V
IC3
RC78L05A
OUT IN
GND
+5V
C6 100 16V
C7 22
C14 22
R8 100
R9 15k :RN
C8 330p
IC4
MC74HC4538AN
VCC
T
A
B
Q
GND
C10 0.01 F
R10 12k :RN
C9 47p
R11 100
R12 100
IC5
MB675429
VD
HD
1/2H
C11 0.01 F
C12 0.01 F
IC6
MC74HC244AN
C23 0.33 :MPS
R44 10k
C13 0.01 F
IC7 (1/4) MC74HC00AN
IC7 (2/4) MC74HC00AN
IC7 (3/4) MC74HC00AN
IC7 (4/4) MC74HC00AN
R16 100
R17 3.3k
Q8 2SA1175
Q9 2SA1175
Q10 2SC2785
R18 5.6k
D12 1SS119
C22 470 16V
R42 22k
D13 RD5.1ESB2
Q11 2SC2785
R47 470
R48 68k
Q12 2SA1175
D14 RD6.8ESB2
D15 1SS119
C26 100 16V
R22 8.2k :RN
R23 12k :RN
Q14 2SC2785
D7 1SS119
R26 100
R28 2.7k :RN
IC8 (1/2) TL082CP
R29 10k
R41 150k :RN
R24 22k :RN
R25 33k :RN
Q15 2SC2785
D8 1SS119
R27 100
IC8 (2/2) TL082CP
R30 100k :RN
R31 10k
C16 22
R32 8.2k :RN
R33 8.2k :RN
R34 8.2k :RN
R35 220k
R36 220k
R37 220k
C17 0.1 :MPS
C18 0.1 :MPS
C19 0.1 :MPS
Q16 2SC2785
Q17 2SC2785
Q18 2SC2785
C20 0.1 :MPS
R39 100k :RN
R40 22k
C21 22
Q19 2SA1175
R38 100k
R45 10k
C25 10
R46 220k
-12V
CAG-4 12P BLK :S-MICRO
12 H
11 H
10
9 +B2
8
7 +B1
6
5 GND
4
3 -B
2
1 G1
TO CAB BOARD CAB-4
CAG-6 11P WHT :S-MICRO
1 IK.B
2 +12V
3 GND
4 -12V
5 BKG.S.P
6 GND
7 DRV
8 BKG
9 ON/OFF
10 BRT
11 CONT
TO CAB BOARD CAB-6
CAG-5 13P WHT :S-MICRO
1 GND
2 BLK
3 CONT.P
4 IKDS
5 BRT.S.P
6 CONT.S.P
7 SW.P
8 PED CL.P
9 GCTL (R)
10 B.P.C.P
11 BKG.P
12 GCTL (G)
13 AUTO ON/OFF
TO CAB BOARD CAB-5
⑨
⑩
⑪
⑫

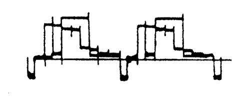
CArg (VIDEO OUT R,G)

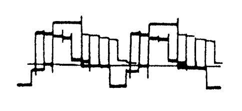
①

1.2Vp-p (H)

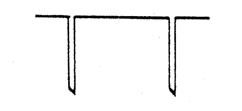
②

4.4Vp-p (H)

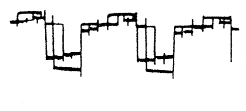
③

20Vp-p (H)

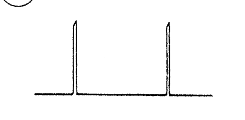
④

140Vp-p (H)

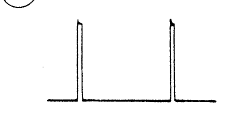
⑤

1.4Vp-p (H)

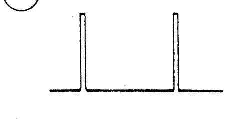
⑥

5.8Vp-p (H)

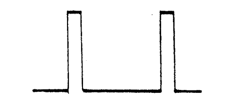
⑦

20Vp-p (H)

⑧

160Vp-p (H)

⑨

4Vp-p (H)

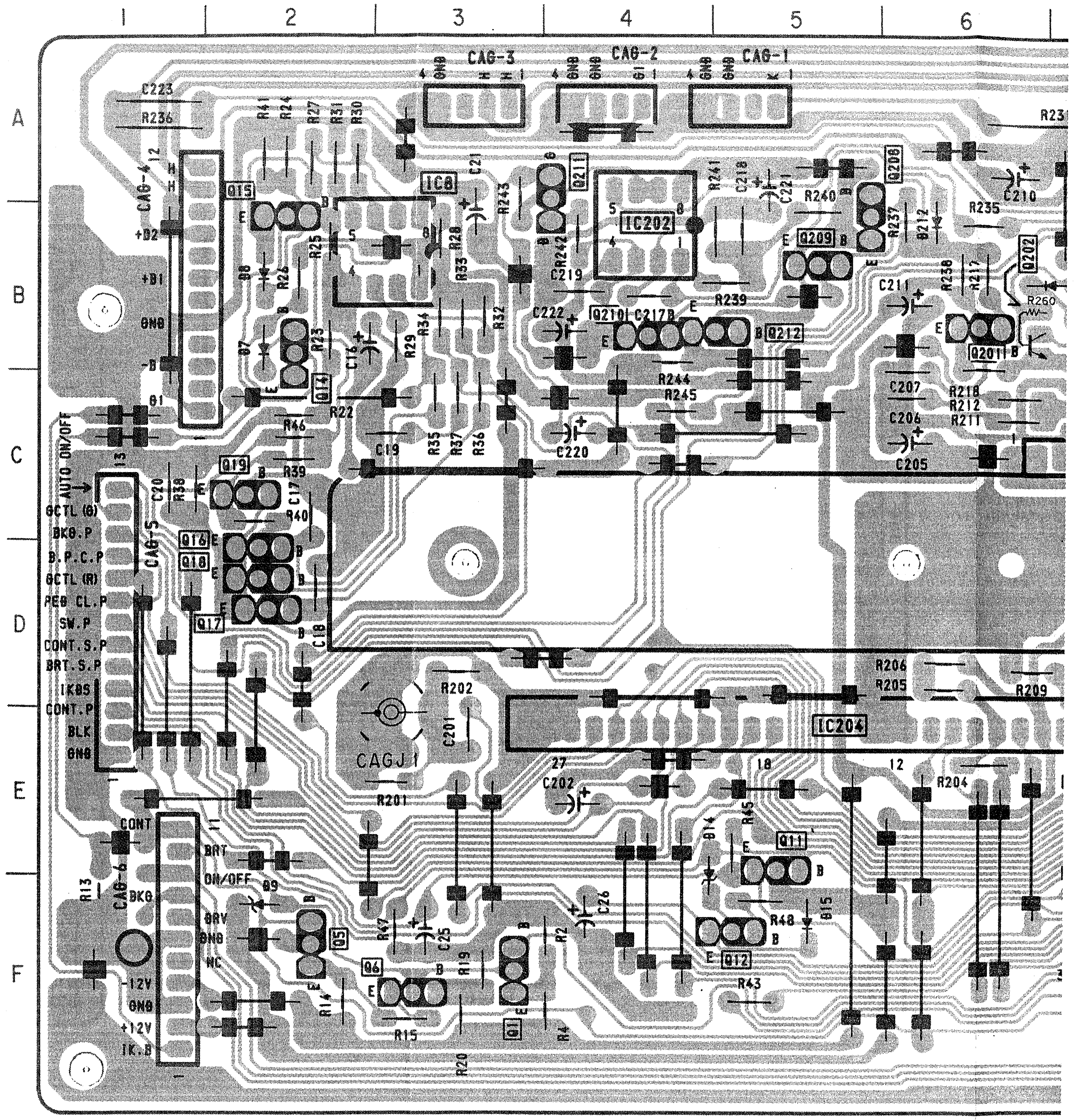
⑩

4Vp-p (H)

⑪

4Vp-p (H)

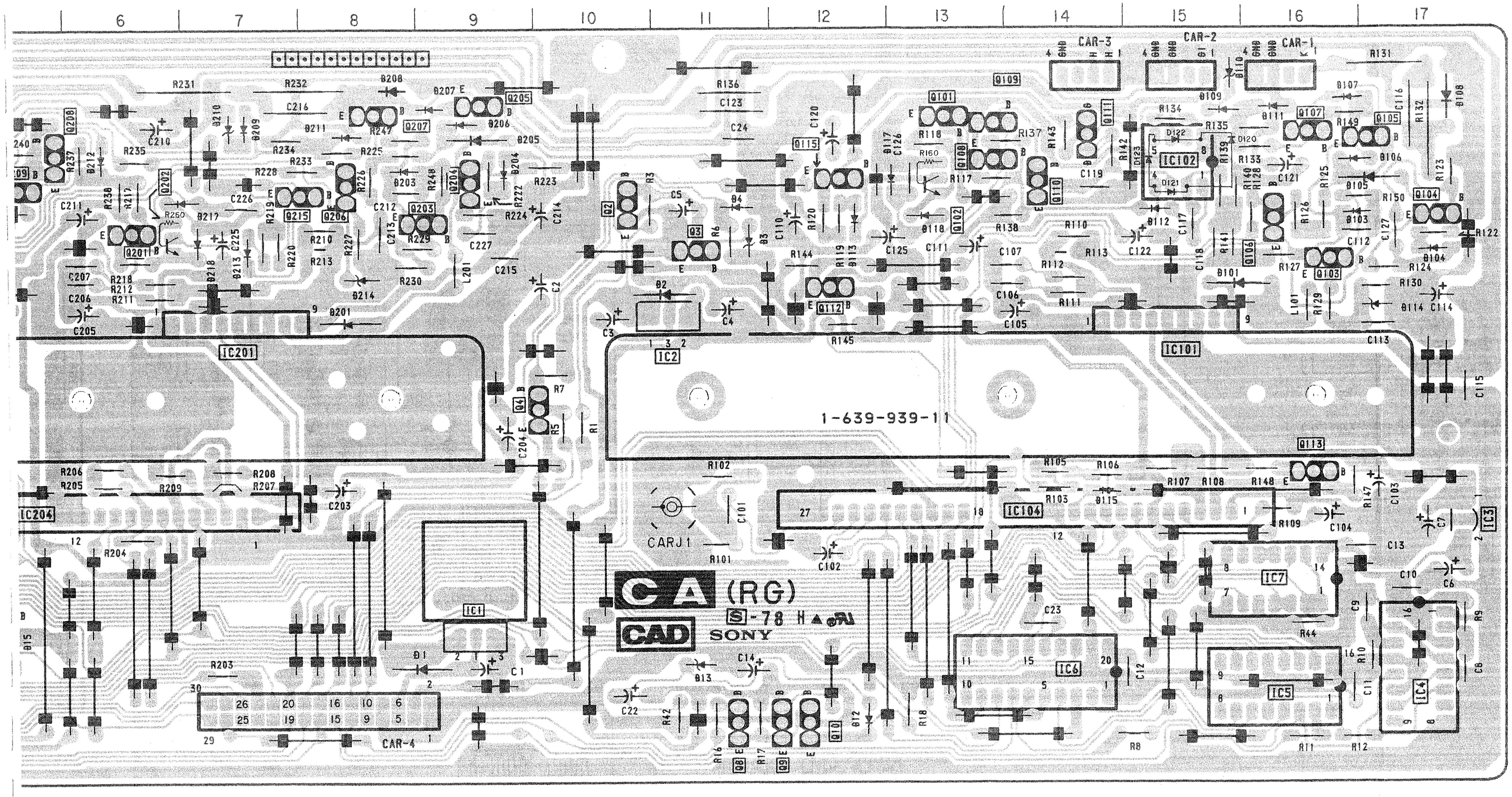
⑫

4Vp-p (H)

CA (RG)	IC1	LM7912CT	–12V REG	D1	V06C	–12V REG PROT
	2	LM7812CT	+12V REG	2	V06C	+12V REG PROT
	3	RC78L05A	+5V REG	3	RD5.1ESB2	+12V PROT
	4	MC74HC4538AN	PULSES GEN	4	1SS119	–12V PROT
	5	MB675429	PULSES GEN	7	1SS119	PEAK ABL
	6	MC74HC244AN	PULSES GEN	8	1SS119	S.T. ABL
	7	MC74HC00AN	PULSES GEN	9	RD6.8ESB2	CONT PROT
	8	TL082CP	PEAK&S.T. ABL	12	1SS119	ON STOP PROT
	101	VPH06	R VIDEO OUT	13	RD5.1ESB2	ON STOP PROT
	102	TL082CP	R AUTO BKG	14	RD6.8ESB2	OFF STOP PROT
	104	TY885002A	R SIGNAL PROCESS	15	1SS119	OFF STOP PROT
	201	VPH06	G VIDE OUT	101	1SS83	R VIDEO OUT PROT
	202	TL082CP	G AUTO BKG	103	1SS119	R Iκ DET-1 PROT
	204	TY885002A	G SIGNAL PROCESS	104	1SS119	R THERM COMP
				105	1SS83	R Iκ DET-2 PROT
	Q1	2SC2785	CONTRAST CONTROL	106	1SS119	R Iκ DET-2 PROT
	2	XDC114ES	+12V PROT	107	1SS119	R Iκ DET-2 PROT
	3	XDC114ES	+12V PROT	109	1SS119	R Iκ DET-2 PROT
	4	2SC2785	–12V PROT	110	RD2.0ESB2	R Iκ DET-2 PROT
	5	2SC2785	BRT-CONT CONTROL	111	1SS119	R Iκ DET-2 PROT
	8	2SA1175	BLK P. GEN	112	1SS119	R AUTO BKG SW
	9	2SA1175	BLK P. GEN	113	1SS119	R THERM COMP
	10	2SC2785	BLK P. GEN	114	RD13ESB2	R Iκ DET-1 PROT
	11	2SC2785	OFF SPOT PROT	115	1SS119	R γ CORR
	12	2SA1175	OFF SPOT PROT	117	1SS119	R OFF SPOT PROT
	14	2SC2785	PEAK ABL	118	1SS119	R OFF SPOT PROT
	15	2SC2785	S.T. ABL	120	1SS119	R AUTO BKG
	16	2SC2785	B S.T. ABL	121	1SS119	R AUTO BKG
	17	2SC2785	G S.T. ABL	122	1SS119	R AUTO BKG
	18	2SC2785	R S.T. ABL	123	1SS119	R AUTO BKG
	19	2SA1175	S.T. ABL	201	1SS83	G VIDEO OUT PROT
	101	2SA1175	R G1 CONT	203	1SS119	G Iκ DET-1 PROT
	102	2SC3209	R G1 CONT	204	1SS119	G THERM COMP
	103	2SA1381	R Iκ DET-1	205	1SS83	G Iκ DET-2 PROT
	104	2SA1381	R CURRENT SOURCE	206	1SS119	G Iκ DET-2 PROT
	105	2SC2785	R Iκ DET-2	207	1SS119	G Iκ DET-2 PROT
	106	2SC3209	R Iκ DET-2	209	1SS119	G Iκ DET-2 PROT
	107	2SA1381	R Iκ DET-2	210	RD2.0ESB2	G Iκ DET-2 PROT
	108	XDA144ES	R AUTO BKG SW	211	1SS119	G Iκ DET-2 PROT
	109	XDA144ES	R AUTO BKG SW	212	1SS119	G AUTO BKG SW
	110	XDC114ES	R AUTO BKG SW	213	1SS119	G THERM COMP
	111	2SK523	R AUTO BKG	214	RD13ESB2	G Iκ DET-1 PROT
	112	2SC2785	R Iκ DET-2	217	1SS119	G OFF SPOT PROT
	113	2SC2785	R γ CORR	218	1SS119	G OFF SPOT PROT
	115	2SA1381	R G1 CONT			
	201	2SA1175	G G1 CONT			
	202	2SC3209	G G1 CONT			
	203	2SA1381	G Iκ DET-1			
	204	2SA1381	G CURRENT SOURCE			
	205	2SC2785	G Iκ DET-2			
	206	2SC3209	G Iκ DET-2			
	207	2SA1381	G Iκ DET-2			
	208	XDA144ES	G AUTO BKG SW			
	209	XDA144ES	G AUTO BKG SW			
	210	XDC114ES	G AUTO BKG SW			
	211	2SK523	G AUTO BKG			
	212	2SC2785	G Iκ DET-2			
	215	2SA1381	G G1 CONT			

– CA(RG) BOARD –


1
2
3
4
5
6
A
B
C
D
E
F
CAG-3
CAG-2
CAG-1
CAG-4
CAG-5
CAG-6
CAGJ1
IC8
IC202
IC204
Q15
Q211
Q208
Q209
Q202
Q210
Q212
Q201
Q14
Q19
Q16
Q18
Q17
Q11
Q12
Q5
Q6
Q1
C223
R236
C210
R235
R240
C218
C221
R241
R237
R212
R238
R260
C211
C207
C206
C205
R218
R212
R211
C219
C222
C217
R239
R244
R245
C220
C19
C20
C17
C18
R38
R39
R40
R46
R22
R23
R25
R26
R28
R29
R33
R35
R36
R37
R243
R242
R41
R24
R27
R31
R30
C21
C15
+B1
+B2
-B
GND
AUTO ON/OFF
BCTL (G)
BKG.P
B.P.C.P
BCTL (R)
PEB CL.P
SW.P
CONT.S.P
BRT.S.P
IKBS
CONT.P
BLK
GND
CONT
BRT
ON/OFF
BKG
BRV
GND
NC
-12V
GND
+12V
IK.B
R202
R206
R205
R209
C201
C202
R201
R204
R45
R48
R43
R47
R19
R2
C25
C26
R14
R15
R20
R4
R13
R230

CA(RG) [VIDEO OUT R.G]

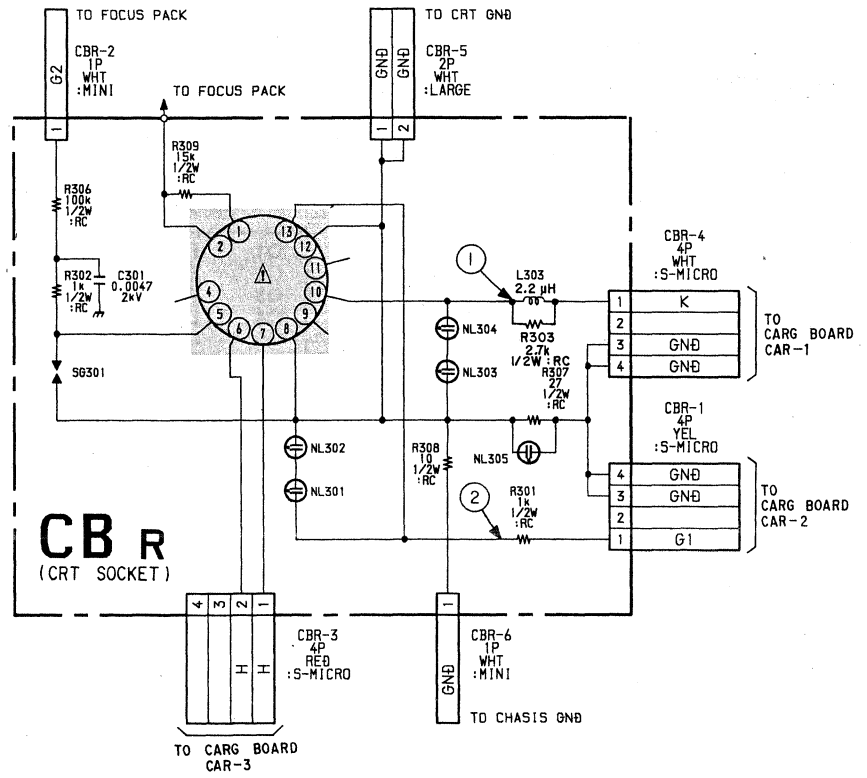

6
7
8
9
10
11
12
13
14
15
16
17
CAR-3
CAR-2
CAR-1
CAR-4
IC201
IC2
IC101
IC104
IC204
IC1
IC6
IC5
IC7
IC4
IC3
IC102
CARJ1
1-639-939-11
CA (RG)
CAD
SONY

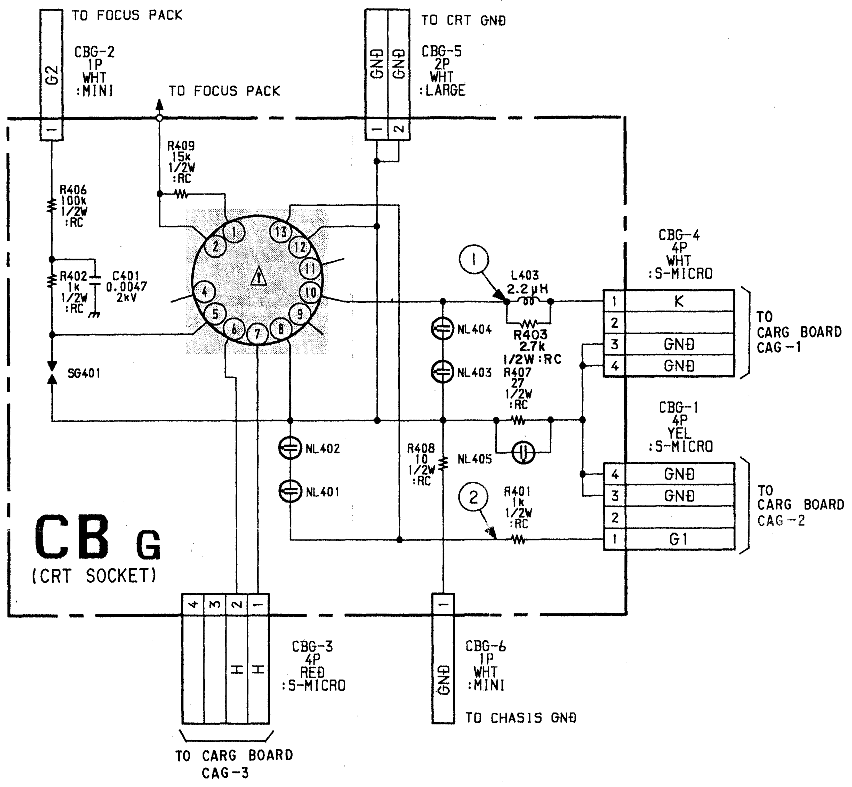
CA(RG) BOARD

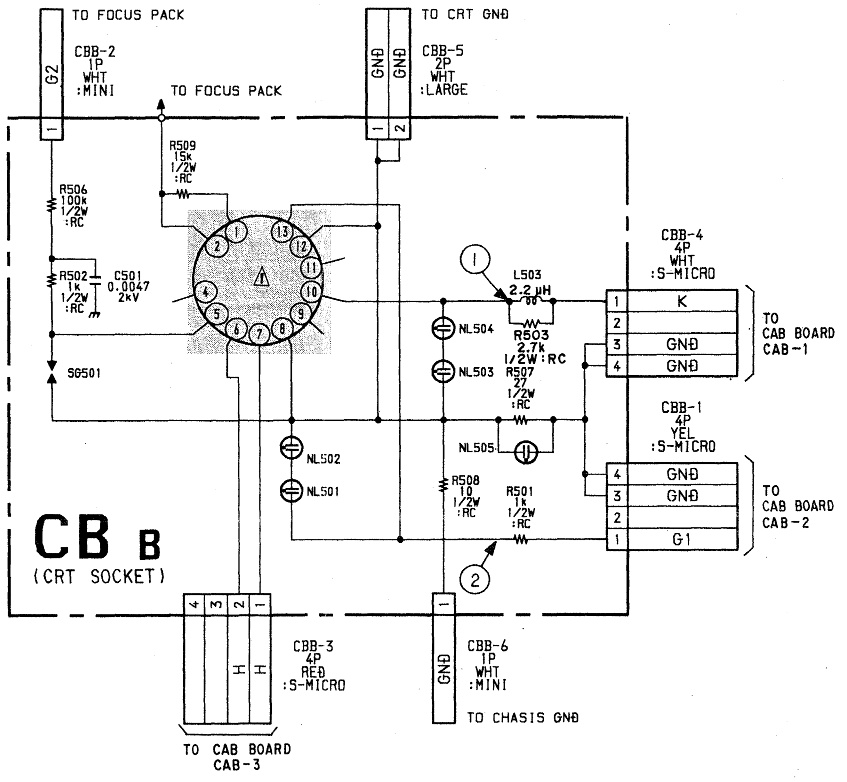
IC	
IC1	D-9
IC2	C-11
IC3	D-17
IC4	F-17
IC5	F-16
IC6	F-14
IC7	D-16
IC8	B-3
IC101	C-15
IC102	B-15
IC104	D-14
IC201	C-7
IC202	B-4
IC204	E-5

TRANSISTOR	
Q1	F-3
Q2	B-10
Q3	B-11
Q4	D-10
Q5	F-2
Q8	F-11
Q9	F-12
Q10	F-12
Q11	E-5
Q12	F-5
Q14	B-2
Q15	B-2
Q16	D-2
Q17	D-2
Q18	D-2
Q19	C-2
Q101	A-13
Q102	B-13
Q103	C-16
Q104	B-17
Q105	A-17
Q106	B-16
Q107	A-16
Q108	B-13
Q109	A-13
Q110	B-14
Q111	A-14
Q112	C-12
Q113	D-16
Q115	B-12
Q201	B-6
Q202	B-6
Q203	B-9
Q204	B-9
Q205	A-9
Q206	B-8
Q207	A-8
Q208	B-5
Q209	B-5
Q210	B-4
Q211	A-4
Q212	B-5
Q215	B-7

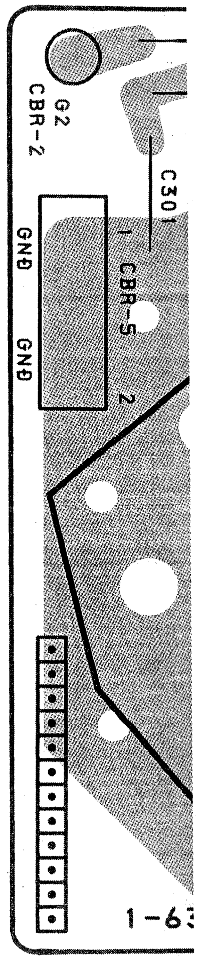
DIODE	
D1	F-9
D2	C-11
D3	B-11
D4	B-11
D7	B-2
D8	B-2
D9	F-2
D12	F-12
D13	F-11
D14	E-4
D15	F-5
D101	C-15
D103	B-17
D104	B-17
D105	B-17
D106	B-17
D107	A-16
D109	A-15
D110	A-15
D111	A-16
D112	B-15
D113	B-12
D114	C-17
D115	D-14
D117	B-13
D118	B-13
D120	B-15
D121	B-15
D122	B-15
D123	B-15
D201	C-8
D203	B-8
D204	B-9
D205	A-9
D206	A-9
D207	A-9
D209	A-7
D210	A-7
D211	A-8
D212	B-6
D213	B-7
D214	C-8
D217	B-7
D218	B-8


TO FOCUS PACK
CBR-2 1P WHT :MINI
G2
TO FOCUS PACK
TO CRT GND
CBR-5 2P WHT :LARGE
GND GND
R309 15k 1/2W :RC
R306 100k 1/2W :RC
R302 1k 1/2W :RC
C301 0.0047 2kV
SG301
①
L303 2.2 μH
R303 2.7k 1/2W :RC
R307 27 1/2W :RC
NL304
NL303
NL302
NL301
NL305
R308 10 1/2W :RC
②
R301 1k 1/2W :RC
CBR-4 4P WHT :S-MICRO
1 K
2
3 GND
4 GND
TO CARG BOARD CAR-1
CBR-1 4P YEL :S-MICRO
4 GND
3 GND
2
1 G1
TO CARG BOARD CAR-2
CB R
(CRT SOCKET)
CBR-3 4P RED :S-MICRO
H H
TO CARG BOARD CAR-3
CBR-6 1P WHT :MINI
GND
TO CHASIS GND

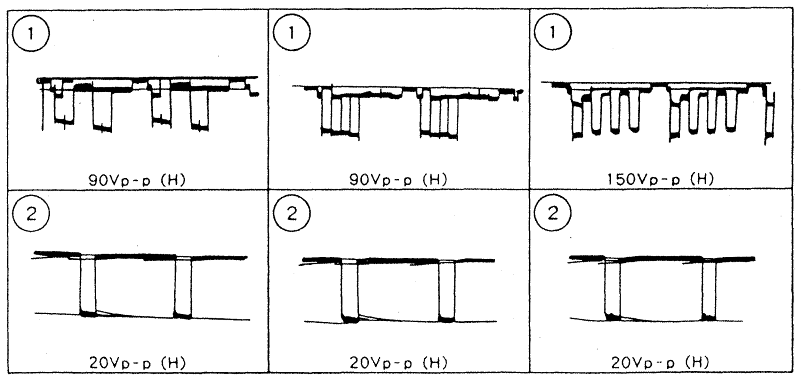

TO FOCUS PACK
CBG-2 1P WHT :MINI
G2
TO FOCUS PACK
TO CRT GND
CBG-5 2P WHT :LARGE
GND GND
R409 15k 1/2W :RC
R406 100k 1/2W :RC
R402 1k 1/2W :RC
C401 0.0047 2kV
SG401
①
L403 2.2 μH
R403 2.7k 1/2W :RC
R407 27 1/2W :RC
NL404
NL403
NL402
NL401
NL405
R408 10 1/2W :RC
②
R401 1k 1/2W :RC
CBG-4 4P WHT :S-MICRO
1 K
2
3 GND
4 GND
TO CARG BOARD CAG-1
CBG-1 4P YEL :S-MICRO
4 GND
3 GND
2
1 G1
TO CARG BOARD CAG-2
CB G
(CRT SOCKET)
CBG-3 4P RED :S-MICRO
H H
TO CARG BOARD CAG-3
CBG-6 1P WHT :MINI
GND
TO CHASIS GND


TO FOCUS PACK
CBB-2 1P WHT :MINI
G2
TO FOCUS PACK
TO CRT GND
CBB-5 2P WHT :LARGE
GND GND
R509 15k 1/2W :RC
R506 100k 1/2W :RC
R502 1k 1/2W :RC
C501 0.0047 2kV
SG501
①
L503 2.2 μH
R503 2.7k 1/2W :RC
R507 27 1/2W :RC
NL504
NL503
NL502
NL501
NL505
R508 10 1/2W :RC
R501 1k 1/2W :RC
②
CBB-4 4P WHT :S-MICRO
1 K
2
3 GND
4 GND
TO CAB BOARD CAB-1
CBB-1 4P YEL :S-MICRO
4 GND
3 GND
2
1 G1
TO CAB BOARD CAB-2
CB B
(CRT SOCKET)
CBB-3 4P RED :S-MICRO
H H
TO CAB BOARD CAB-3
CBB-6 1P WHT :MINI
GND
TO CHASIS GND

– CBR BOAR

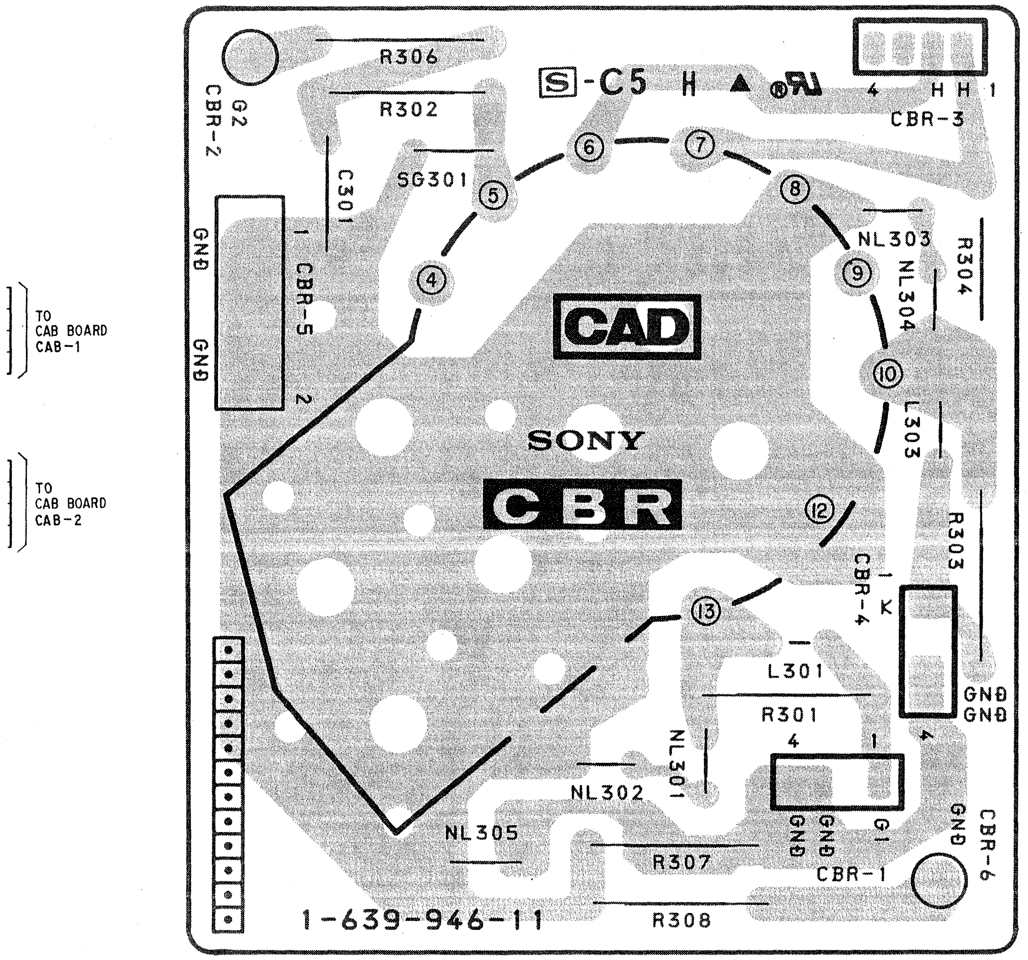

G2
CBR-2
C301
GND
CBR-5
1
2
GND
1-63

CB (R) BOARD **CB (G) BOARD** **CB (B) BOARD**

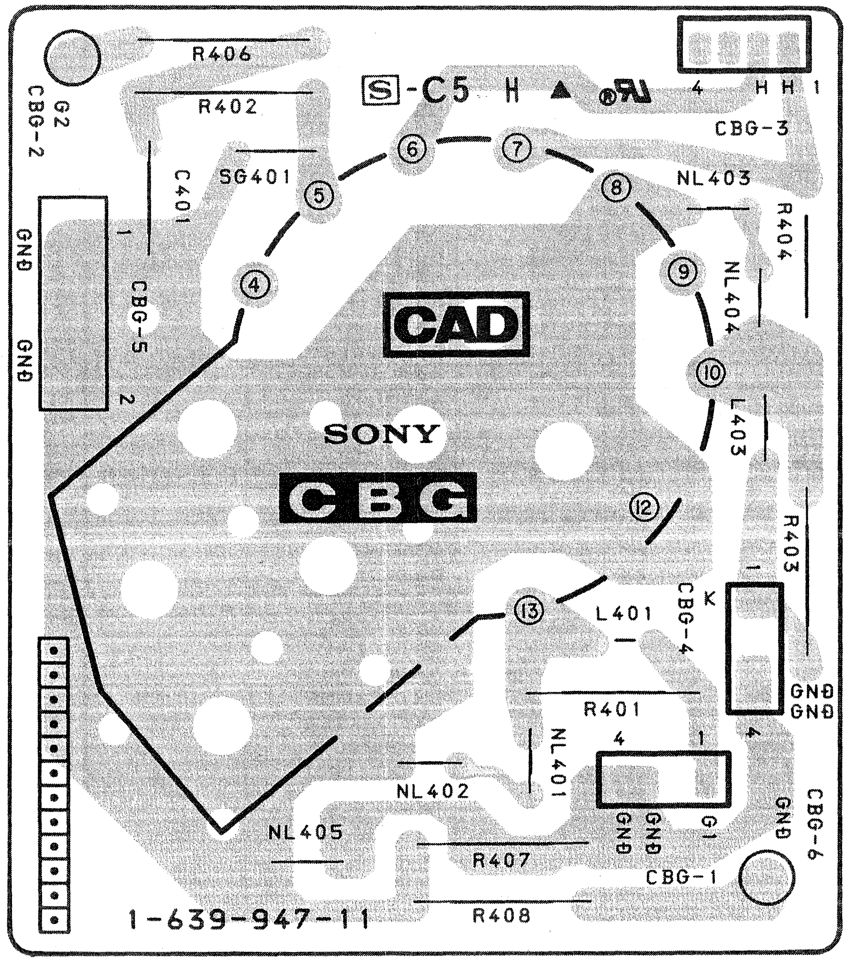


CBR CBG CBB [CRT SOCKET]

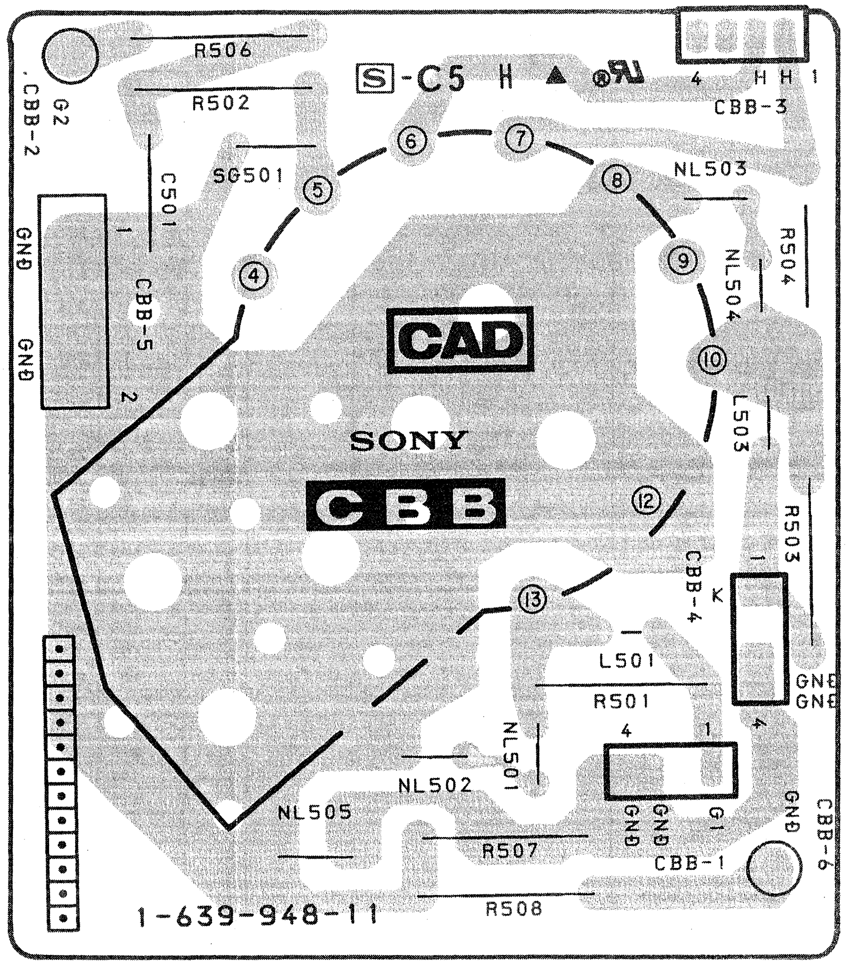
- CBR BOARD -


TO CAB BOARD CAB-1
TO CAB BOARD CAB-2
R306
R302
G2
CBR-2
C301
SG301
Ⓢ-C5
CBR-3
4 H H 1
④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑫ ⑬
NL303
NL304
R304
GND
GND
1
CBR-5
2
CAD
SONY
CBR
L303
R303
CBR-4
1 K
L301
GND
GND
R301
4 1
NL301
NL302
NL305
GND GND G1
GND
CBR-6
R307
CBR-1
4
1-639-946-11
R308

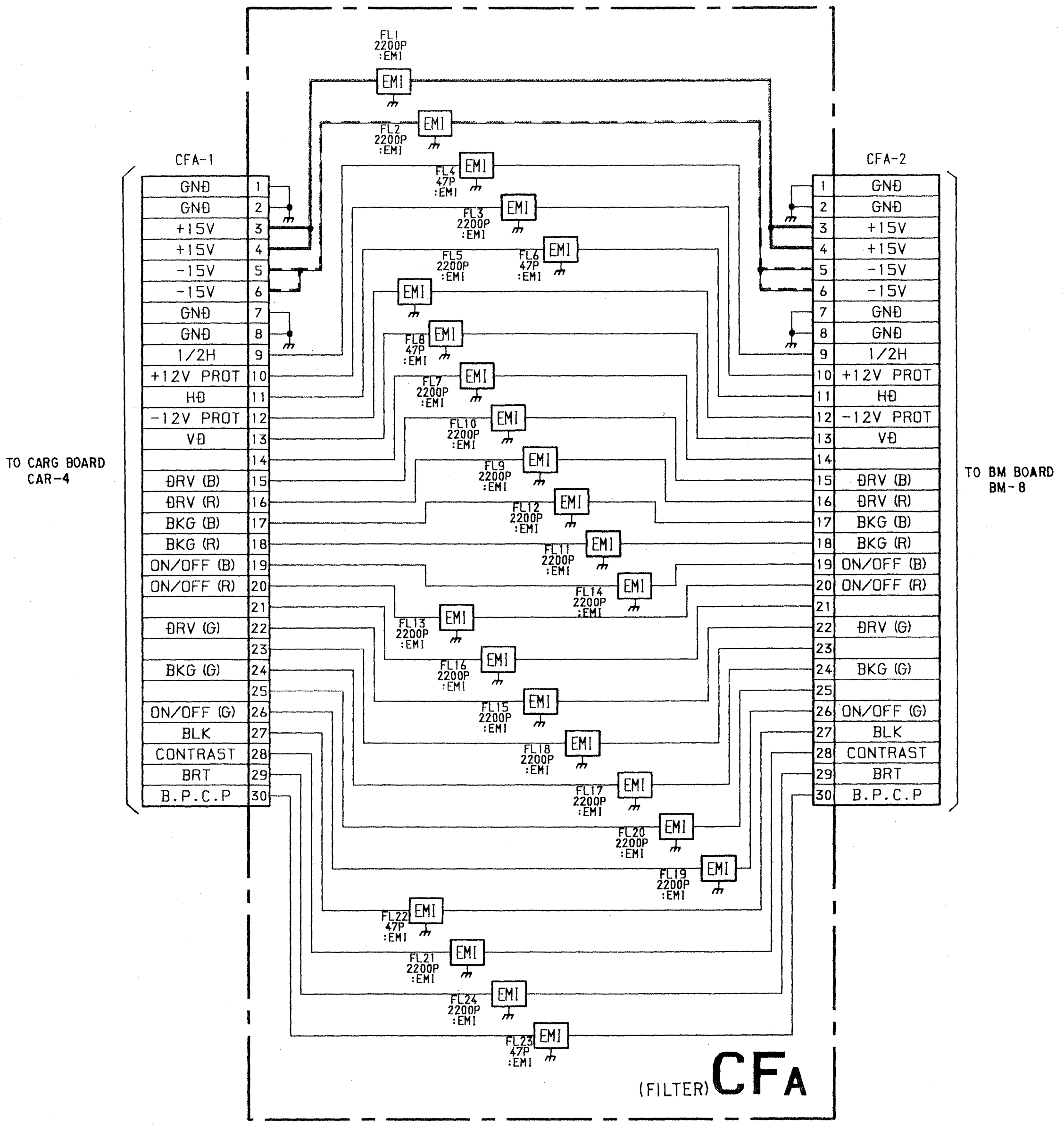
- CBG BOARD -

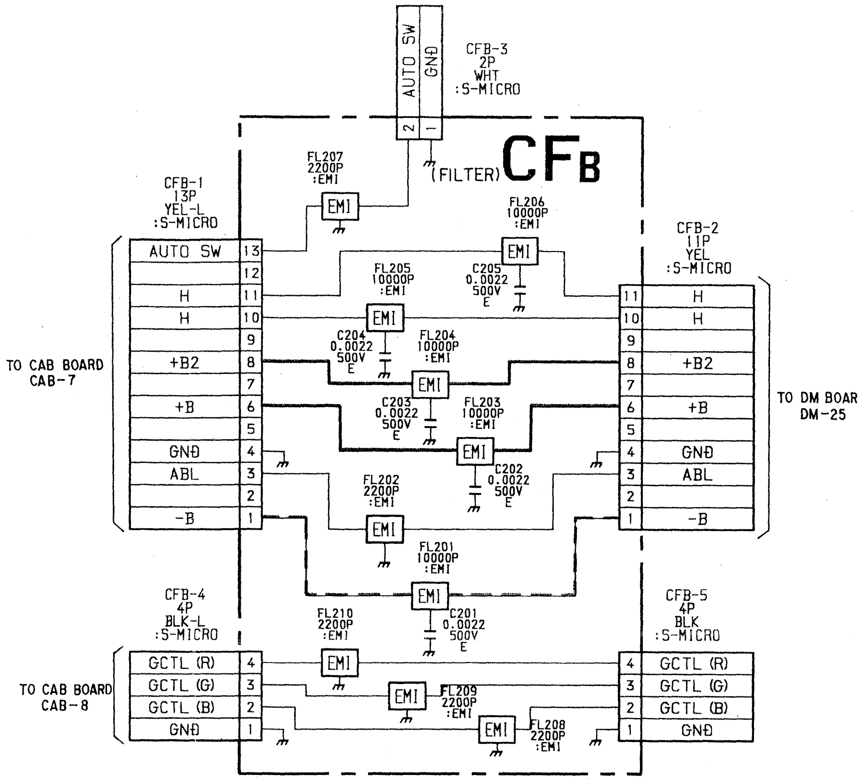

R406
R402
G2
CBG-2
C401
SG401
Ⓢ-C5
CBG-3
4 H H 1
④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑫ ⑬
NL403
R404
NL404
GND
GND
1
CBG-5
2
CAD
SONY
CBG
L403
R403
1
CBG-4
K
L401
GND
GND
R401
4 1
NL401
NL402
NL405
GND GND G1
GND
CBG-6
4
R407
CBG-1
1-639-947-11
R408

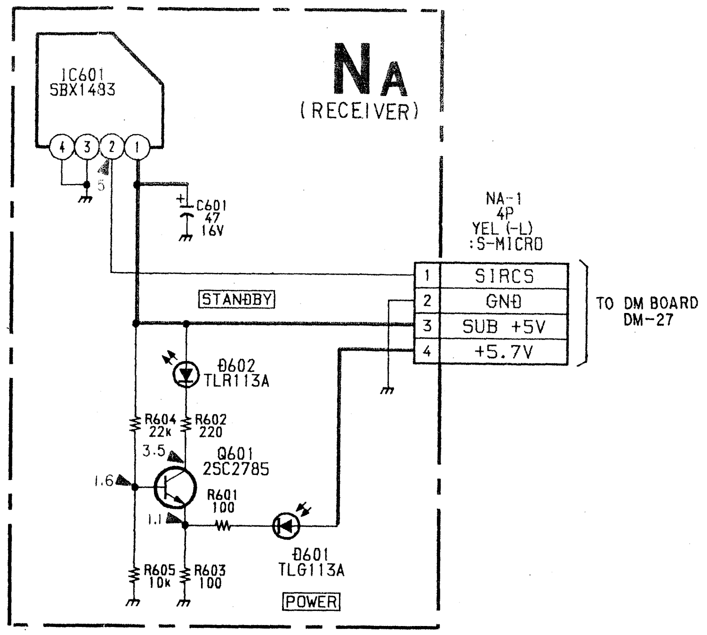
- CBB BOARD -

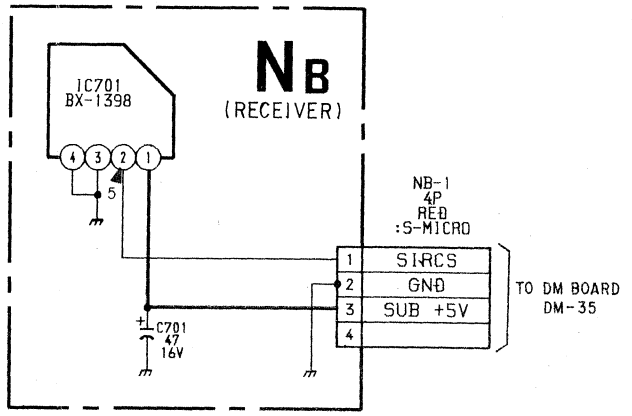

R506
R502
G2
CBB-2
C501
SG501
Ⓢ-C5
CBB-3
4 H H 1
④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑫ ⑬
NL503
R504
NL504
GND
GND
1
CBB-5
2
CAD
SONY
CBB
L503
R503
CBB-4
K
1
L501
GND
GND
R501
4 1
NL501
NL502
NL505
GND GND G1
GND
CBB-6
4
R507
CBB-1
1-639-948-11
R508

– CFA


CFA-1
CFA-2
GND
+15V
-15V
1/2H
+12V PROT
HD
-12V PROT
VD
DRV (B)
DRV (R)
BKG (B)
BKG (R)
ON/OFF (B)
ON/OFF (R)
DRV (G)
BKG (G)
ON/OFF (G)
BLK
CONTRAST
BRT
B.P.C.P
TO CARG BOARD CAR-4
TO BM BOARD BM-8
FL1 2200P :EMI
FL2 2200P :EMI
FL3 2200P :EMI
FL4 47P :EMI
FL5 2200P :EMI
FL6 47P :EMI
FL7 2200P :EMI
FL8 47P :EMI
FL9 2200P :EMI
FL10 2200P :EMI
FL11 2200P :EMI
FL12 2200P :EMI
FL13 2200P :EMI
FL14 2200P :EMI
FL15 2200P :EMI
FL16 2200P :EMI
FL17 2200P :EMI
FL18 2200P :EMI
FL19 2200P :EMI
FL20 2200P :EMI
FL21 2200P :EMI
FL22 47P :EMI
FL23 47P :EMI
FL24 2200P :EMI
EMI
(FILTER) CFA


AUTO SW
GND
CFB-3 2P WHT :S-MICRO
(FILTER) CFB
CFB-1 13P YEL-L :S-MICRO
CFB-2 11P YEL :S-MICRO
AUTO SW
H
+B2
+B
GND
ABL
-B
TO CAB BOARD CAB-7
TO DM BOARD DM-25
FL207 2200P :EMI
FL206 10000P :EMI
FL205 10000P :EMI
C205 0.0022 500V E
C204 0.0022 500V E
FL204 10000P :EMI
C203 0.0022 500V E
FL203 10000P :EMI
C202 0.0022 500V E
FL202 2200P :EMI
FL201 10000P :EMI
C201 0.0022 500V E
FL210 2200P :EMI
FL209 2200P :EMI
FL208 2200P :EMI
CFB-4 4P BLK-L :S-MICRO
CFB-5 4P BLK :S-MICRO
GCTL (R)
GCTL (G)
GCTL (B)
GND
TO CAB BOARD CAB-8
EMI


NA
(RECEIVER)
IC601 SBX1483
C601 47 16V
STANDBY
D602 TLR113A
R604 22k
R602 220
3.5
Q601 2SC2785
1.6
1.1
R601 100
D601 TLG113A
R605 10k
R603 100
POWER
NA-1 4P YEL (-L) :S-MICRO
SIRCS
GND
SUB +5V
+5.7V
TO DM BOARD DM-27


NB
(RECEIVER)
IC701 BX-1398
5
C701 47 16V
NB-1 4P RED :S-MICRO
SIRCS
GND
SUB +5V
TO DM BOARD DM-35

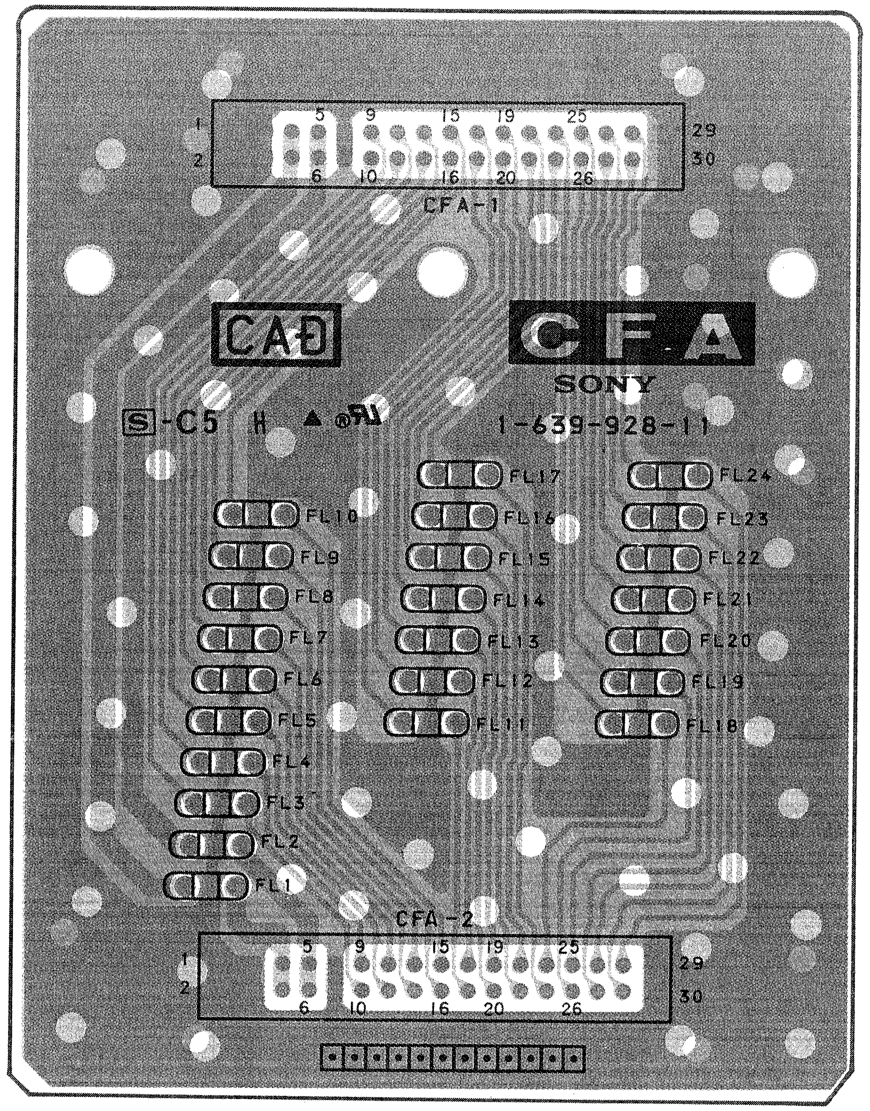
NA	IC601	SBX1483	IR RECIEVER
	Q601	2SC2785	LED SW
	D601	TLG113A	POWER
	602	TLR113A	STANDBY

NB	IC701	BX-1398	IR RECIEVER

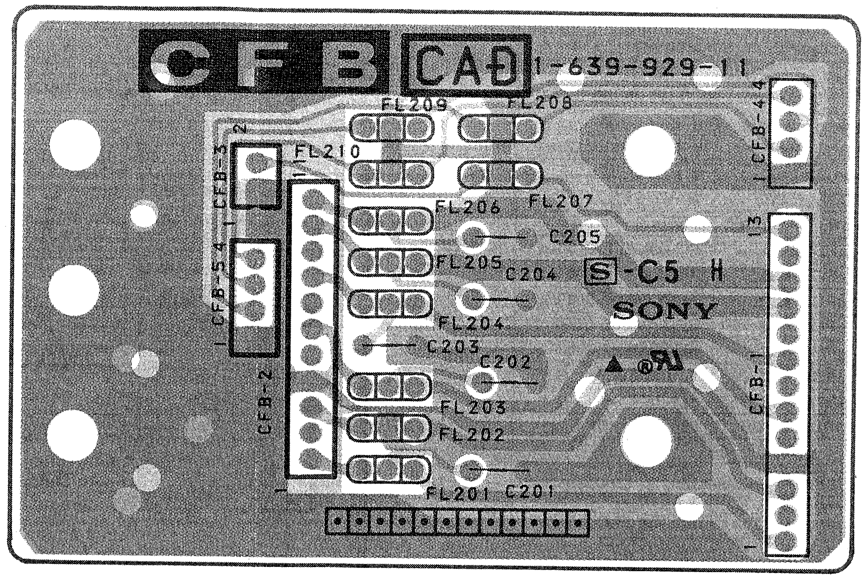
– CFA BOARD –

TO DM BOARD DM-27

TO DM BOARD DM-35

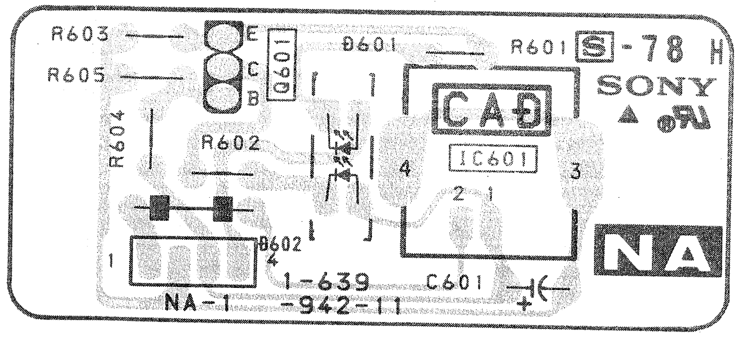

CFA-1
1
2
5
6
9
10
15
16
19
20
25
26
29
30
CAD
CFA
SONY
S-C5 H
1-639-928-11
FL1
FL2
FL3
FL4
FL5
FL6
FL7
FL8
FL9
FL10
FL11
FL12
FL13
FL14
FL15
FL16
FL17
FL18
FL19
FL20
FL21
FL22
FL23
FL24
CFA-2

– CFB BOARD –

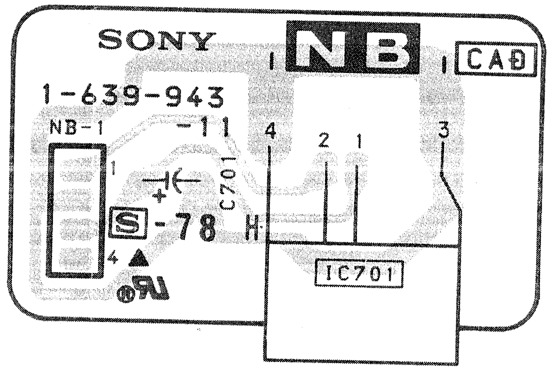

CFB
CAD
1-639-929-11
FL209
FL208
FL210
FL206
FL207
C205
FL205
C204
S-C5 H
SONY
FL204
C203
C202
FL203
FL202
FL201
C201
CFB-1
CFB-2
CFB-3
CFB-4
CFB-5

• ▨ : Pattern from the side which enables seeing.
• ▨ : Pattern of the rear side.

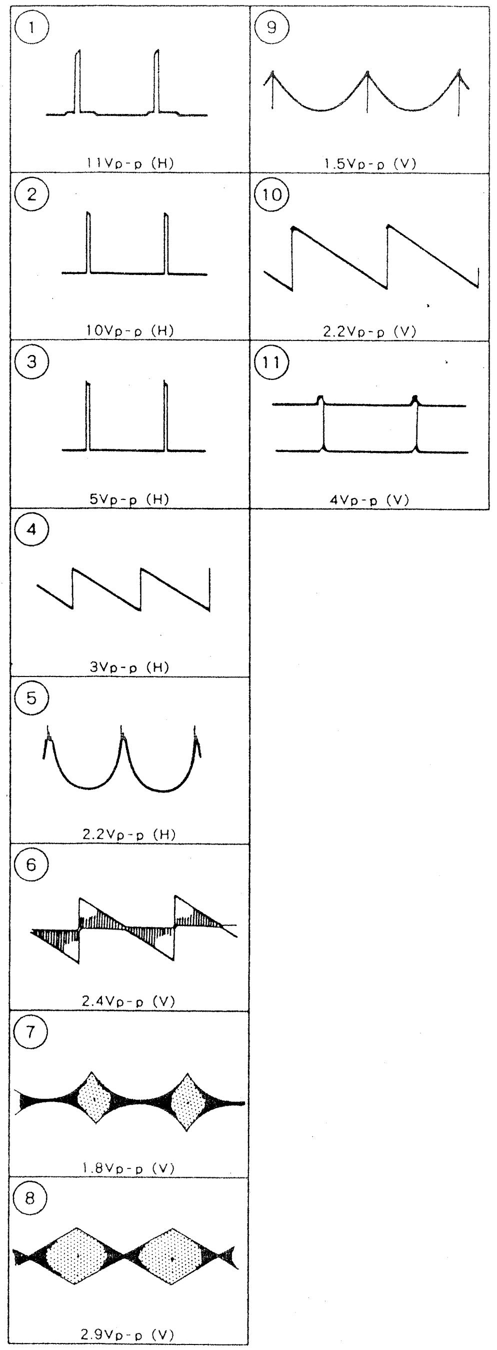
– NA BOARD –


R603
R605
E
C
B
Q601
D601
R601
S-78 H
SONY
CAD
R604
R602
IC601
4
3
2
1
D602
NA-1
1-639
-942-11
C601
NA

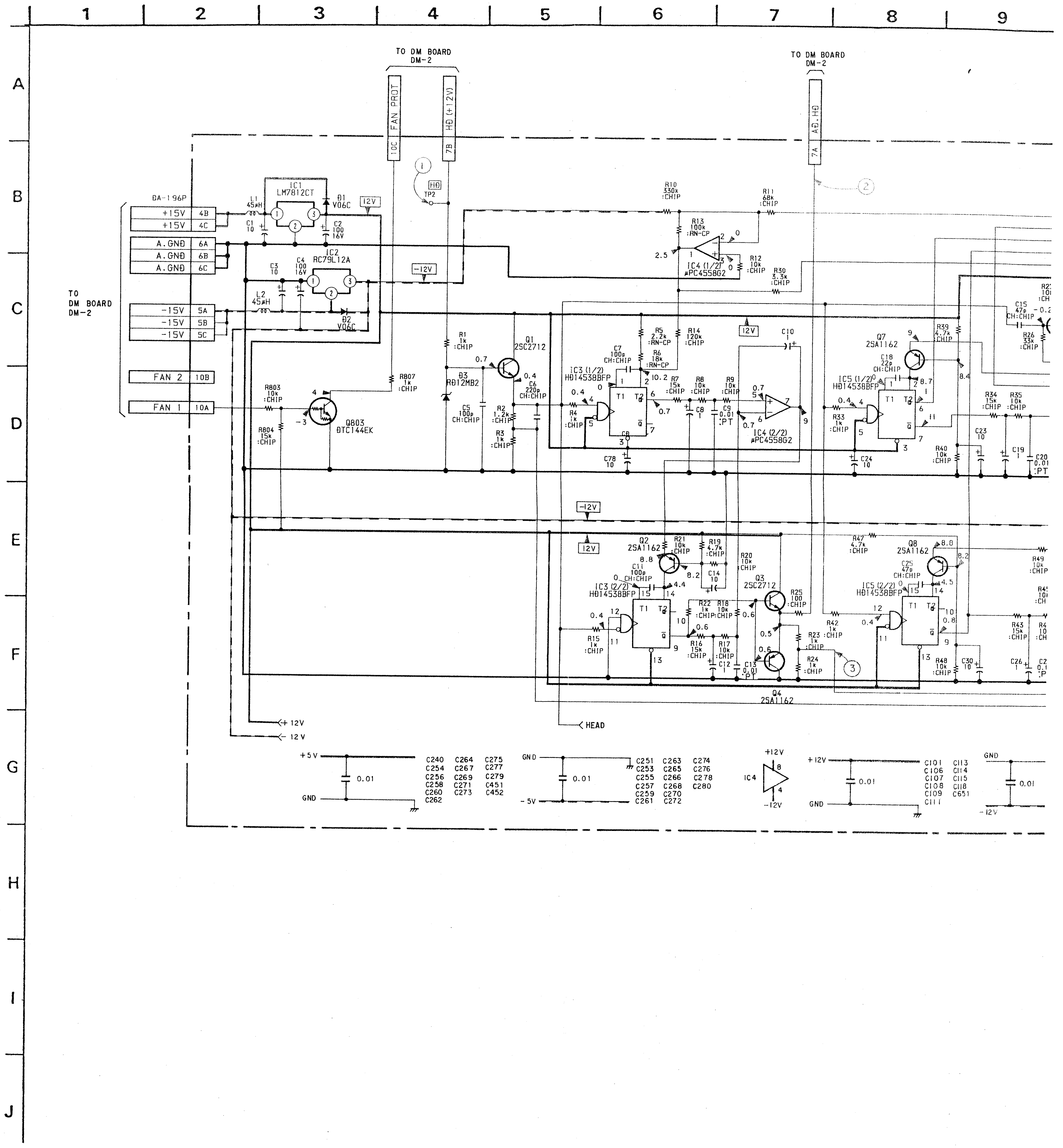
– NB BOARD –


SONY
NB
CAD
1-639-943
-11
NB-1
4
2
1
3
C701
S-78 H
IC701

DA BOARD (1/2)



DA (1/2)	IC1	LN7812CT	+12V REG.
	2	RC79L12A	−12V REG.
	3	HD14538BFP	AD•HD GEN.
	4	μPC4558G2	AD•HD LEVEL COMP.
	5	HD14538BFP	H. BLK GEN.
	6	μPC4558G2	H. BLK LEVEL COMP.
	7	μPC393G2	H. BLK LEVEL DET
	201	CXA1158P	WAVE GEN.
	202	SN74HC04ANS	INV.
	203	μPC814G2	REGI WAVE BUFF-1
	204	μPC814G2	REGI WAVE BUFF-2
	205	μPC814G2	REGI WAVE BUFF-3
	206	μPC814G2	REGI WAVE BUFF-4
	207	μPC814G2	REGI WAVE BUFF-5
	401	μPC814G2	V. BLK SW
	402	SN74HCT137NS	BLK MIX
	601	μPC4558G2	LEVEL SHIFT
	Q1	2SC2712	HD BUFF
	2	2SA1162	V-I CONV-1
	3	2SC2712	AD•HD BUFF-1
	4	2SA1162	AD•HD BUFF-2
	5	2SC2712	HD AMP-1
	6	2SC2712	HD AMP-2
	7	2SA1162	V-I CONV-2
	8	2SA1162	V-I CONV-3
	11	2SA1162	V-I CONV-5
	201	2SC2712	AD•HD BUFF-1
	202	2SA1162	AD•HD BUFF-2
	203	2SC2712	VD BUFF
	204	2SC2712	1/2 V. BUFF
	205	2SC2712	1/2 H. BUFF
	401	2SC2712	BLK BUFF-1
	402	2SA1162	BLK BUFF-2
	701	FMW2	SIZE ABL
	702	IMX2	MULTIPLEX-1
	703	FMS2	SIZE ABL
	704	FMW1	MULTIPLEX-2
	705	FMW1	SIZE ABL
	706	IMX2	MULTIPLEX-3
	707	2SC2712	SIZE ABL
	708	2SA1162	MULTIPLEX-4
	709	FMS2	SIZE ABL
	801	2SC3668	MULTIPLEX-5
	802	2SA1428O	SIZE ABL
	803	DTC144EK	MULTIPLEX-6
			SIZE ABL
	D1	V06C	MULTIPLEX-7
	2	V06C	SIZE ABL
	3	RD12M-B2	MULTIPLEX-8
	207	1S2837	LIMITTER
	401	1S2837	+5.7V RIPPLE FILTER
	402	1S2837	−5.7V RIPPLE FILTER
	701	1S2837	FAN PROT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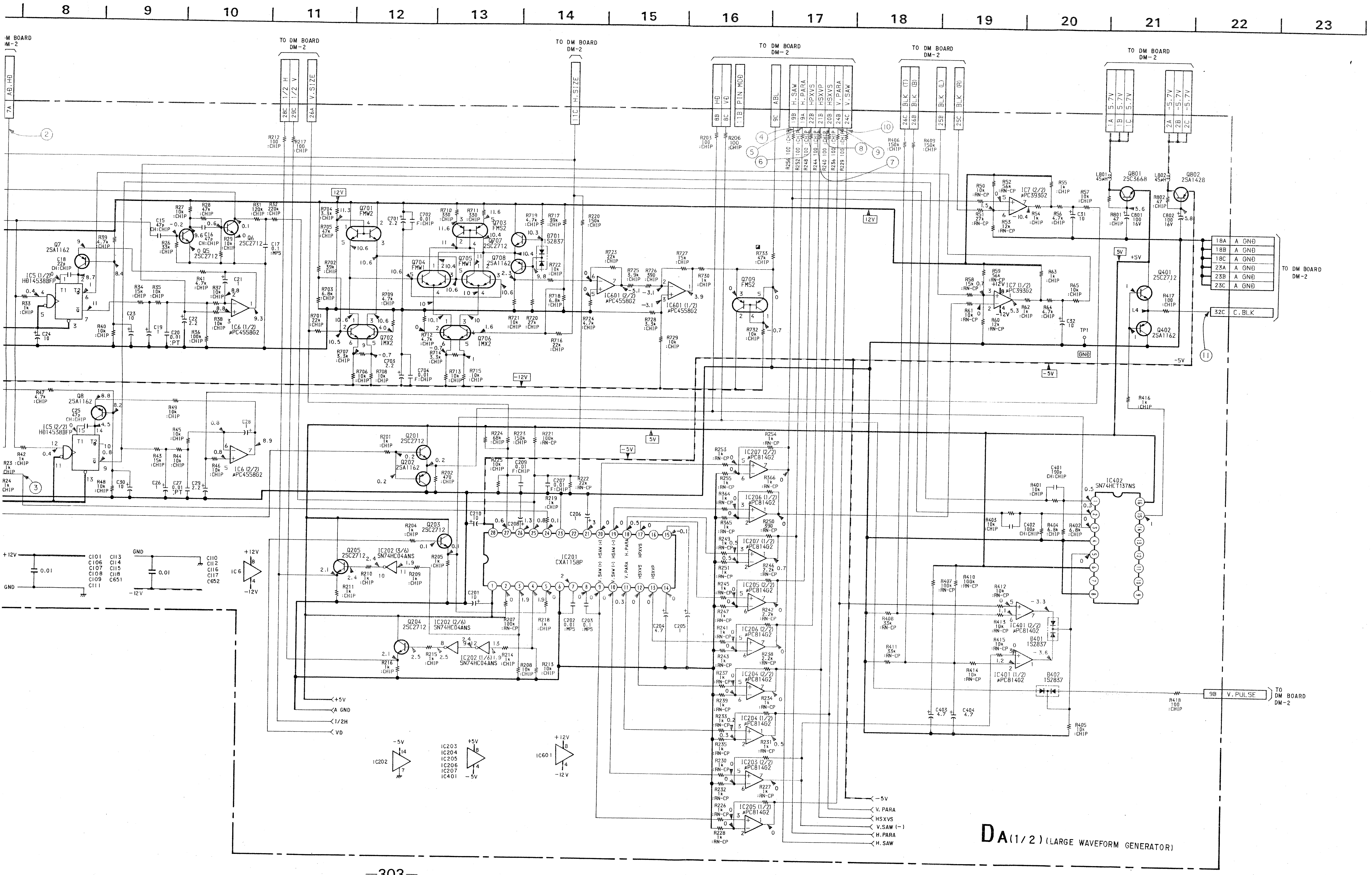
J
TO DM BOARD DM-2
FAN PROT
10C
HD (+12V)
7B
AD. HD
7A
TO DM BOARD DM-2
BA-196P
+15V 4B
+15V 4C
A.GND 6A
A.GND 6B
A.GND 6C
-15V 5A
-15V 5B
-15V 5C
FAN 2 10B
FAN 1 10A
IC1 LM7812CT
IC2 RC79L12A
D1 V06C
D2 V06C
Q1 2SC2712
Q2 2SA1162
Q3 2SC2712
Q4 2SA1162
Q7 2SA1162
Q8 2SA1162
Q803 DTC144EK
D3 RD12MB2
IC3 (1/2) HD14538BFP
IC3 (2/2) HD14538BFP
IC4 (1/2) μPC4558G2
IC4 (2/2) μPC4558G2
IC5 (1/2) HD14538BFP
IC5 (2/2) HD14538BFP
12V
-12V
HEAD
TP2
+5V
GND
-5V
+12V
-12V
0.01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23
TO DM BOARD DM-2
7A AG.HD
28C 1/2 H
29C 1/2 V
26A V.SIZE
11C H.SIZE
8B HD
8C VD
11B PIN MGB
9C ABL
19B H.SAW
19A H.PARA
22B HPXVS
21B HSXVP
20B HSXVS
24B V.PARA
24C V.SAW
26C BLK (T)
26B BLK (B)
25B BLK (L)
25C BLK (R)
1A 5.7V
1B 5.7V
1C 5.7V
2A -5.7V
2B -5.7V
2C -5.7V
18A A GND
18B A GND
18C A GND
23A A GND
23B A GND
23C A GND
32C C.BLK
9B V.PULSE
IC5 (1/2) HD14538BFP
IC5 (2/2) HD14538BFP
IC6 (1/2) μPC4558G2
IC6 (2/2) μPC4558G2
IC601 (1/2) μPC4558G2
IC601 (2/2) μPC4558G2
IC7 (1/2) μPC393G2
IC7 (2/2) μPC393G2
IC201 CXA1158P
IC202 SN74HC04ANS
IC203 μPC814G2
IC204 μPC814G2
IC205 μPC814G2
IC206 μPC814G2
IC207 μPC814G2
IC401 (1/2) μPC814G2
IC401 (2/2) μPC814G2
IC402 SN74HCT137NS
Q5 2SC2712
Q6 2SC2712
Q7 2SA1162
Q8 2SA1162
Q201 2SC2712
Q202 2SA1162
Q203 2SC2712
Q204 2SC2712
Q205 2SC2712
Q401 2SC2712
Q402 2SA1162
Q701 FMW2
Q702 IMX2
Q703 FMS2
Q704 FMW1
Q705 FMW1
Q706 IMX2
Q707 2SC2712
Q708 2SA1162
Q709 FMS2
Q801 2SC3668
Q802 2SA1428
D401 1S2837
D402 1S2837
D701 1S2837
L801 45μH
L802 45μH
TP1
GND
12V
-12V
5V
-5V
+5V
A GND
1/2H
VD
V.PARA
HSXVS
V.SAW (-)
H.PARA
H.SAW
+12V
C101 C106 C107 C108 C109 C111
C113 C114 C115 C118 C651
0.01
C110 C112 C116 C117 C652
IC6
IC202
IC203 IC204 IC205 IC206 IC207 IC401
IC601

DA(1/2) (LARGE WAVEFORM GENERATOR)

DA [LARGE WAVEFORM GENERATOR]

DA BOARD
(COMPONENT SIDE)

IC	
IC1	F-11
IC2	F-13
IC4	B-11
IC6	B-11
IC7	B-9
IC9	D-12
IC11	F-9
IC12	B-13
IC14	B-12
IC15	A-7
IC16	F-12
IC17	F-12
IC18	D-11
IC20	D-12
IC21	E-11
IC22	E-12
IC201	D-7
IC202	C-6
IC203	D-3
IC204	D-3
IC205	D-4
IC206	D-4
IC207	D-5
IC208	A-2
IC209	A-3
IC210	F-2
IC211	A-3
IC212	A-4
IC214	F-1
IC215	D-2
IC216	D-2
IC401	F-2
IC402	F-4
IC601	B-8
IC701	F-13

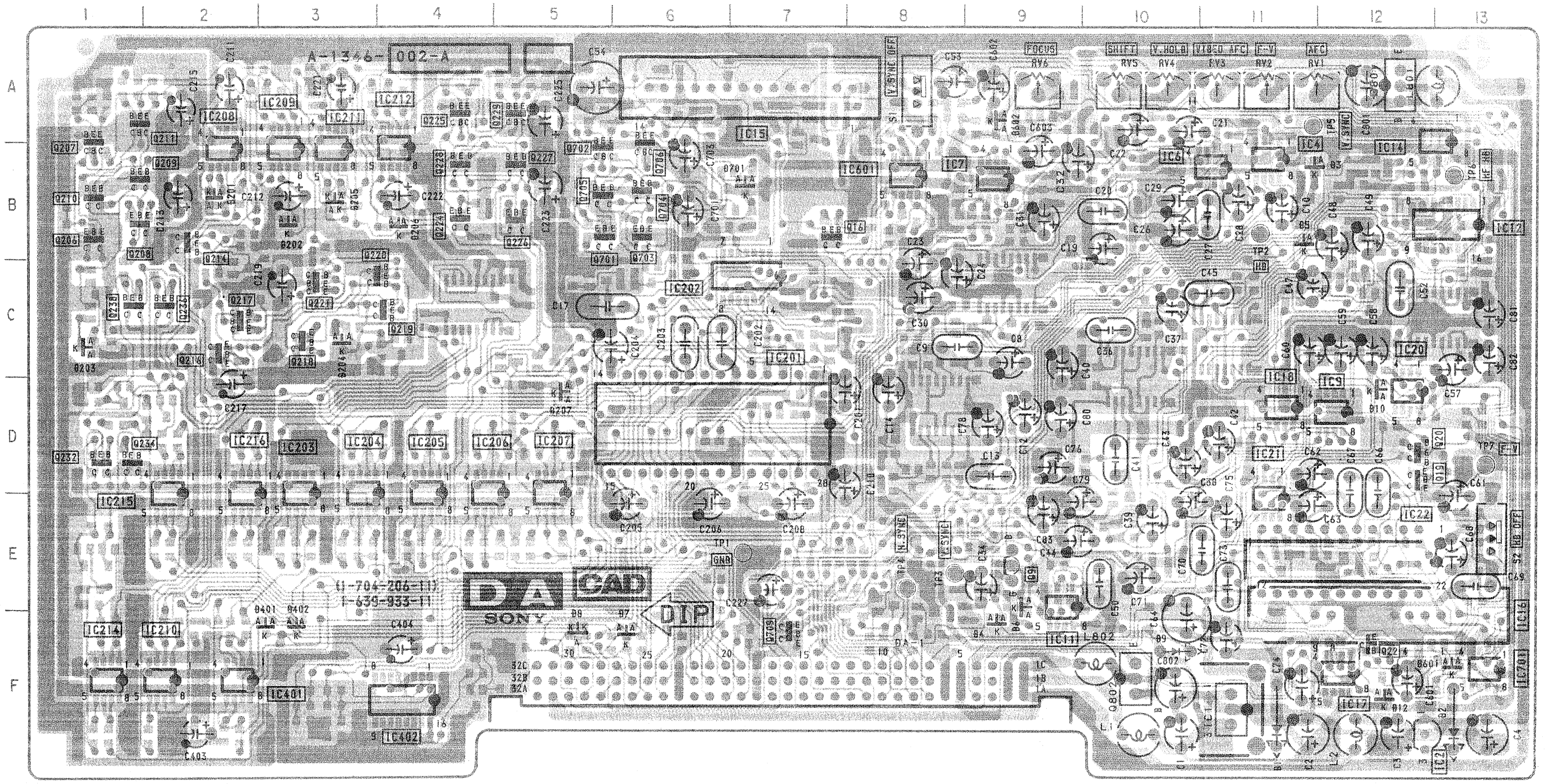
TRANSISTOR	
Q9	E-9
Q16	B-7
Q19	D-12
Q20	D-12
Q22	F-12
Q206	B-1
Q207	B-1
Q208	B-1
Q209	B-1
Q210	B-1
Q211	A-2
Q214	B-2
Q216	C-2
Q217	C-2
Q218	C-3
Q219	C-4
Q220	C-3
Q221	C-3
Q224	B-4
Q225	A-4
Q226	B-5
Q227	B-5
Q228	B-4
Q229	A-5
Q232	D-1
Q234	D-1
Q236	C-2
Q238	C-1
Q701	B-5
Q702	B-5
Q703	B-6
Q704	B-6
Q705	B-5
Q706	B-6
Q709	F-7
Q801	A-12
Q802	F-10

DIODE	
D1	F-11
D2	F-13
D3	B-12
D4	F-9
D5	B-11
D6	F-9
D7	F-7
D8	F-5
D9	F-10
D10	D-12
D12	F-12
D201	B-2
D202	B-3
D203	C-1
D204	C-3
D205	B-3
D206	B-4
D207	D-5
D401	F-3
D402	F-3
D601	F-13
D602	A-9
D701	B-7

VARIABLE RESISTOR	
RV1	A-11
RV2	A-11
RV3	A-11
RV4	A-10
RV5	A-10
RV6	A-9

– DA BOARD –

-COMPONENT SIDE-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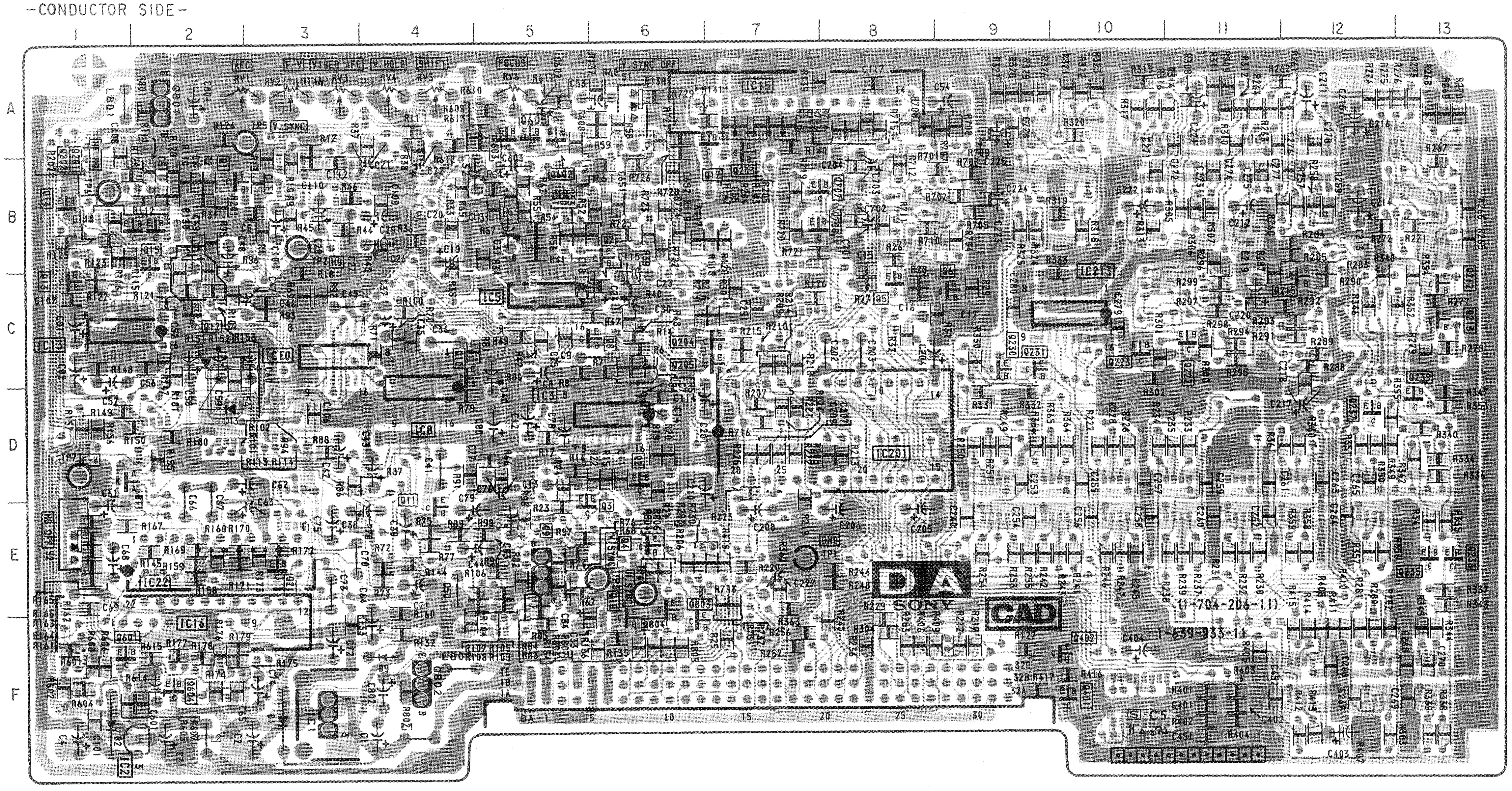
A-1346-002-A
FOCUS
RV6
SHIFT
RV5
V.HOLD
RV4
VIDEO AFC
RV3
F-V
RV2
AFC
RV1
V.SYNC OFF
DA
SONY
CAD
DIP
1-704-206-11
1-639-933-11
TP1
GND
H.SYNC
V.SYNC
HB OFF

– DA BOARD –

–CONDUCTOR SIDE–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E
F
AFC
F-V
VIDEO AFC
V.HOLD
SHIFT
FOCUS
V.SYNC OFF
RV1
RV2
RV3
RV4
RV5
RV6
V.SYNC
IC1
IC2
IC3
IC5
IC8
IC10
IC13
IC15
IC16
IC22
IC201
IC213
DA
SONY
CAD
1-704-206-11
1-639-933-11
DA-1
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15
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25
30

• ░ : Pattern from the side which enables seeing.
• ▒ : Pattern of the rear side.

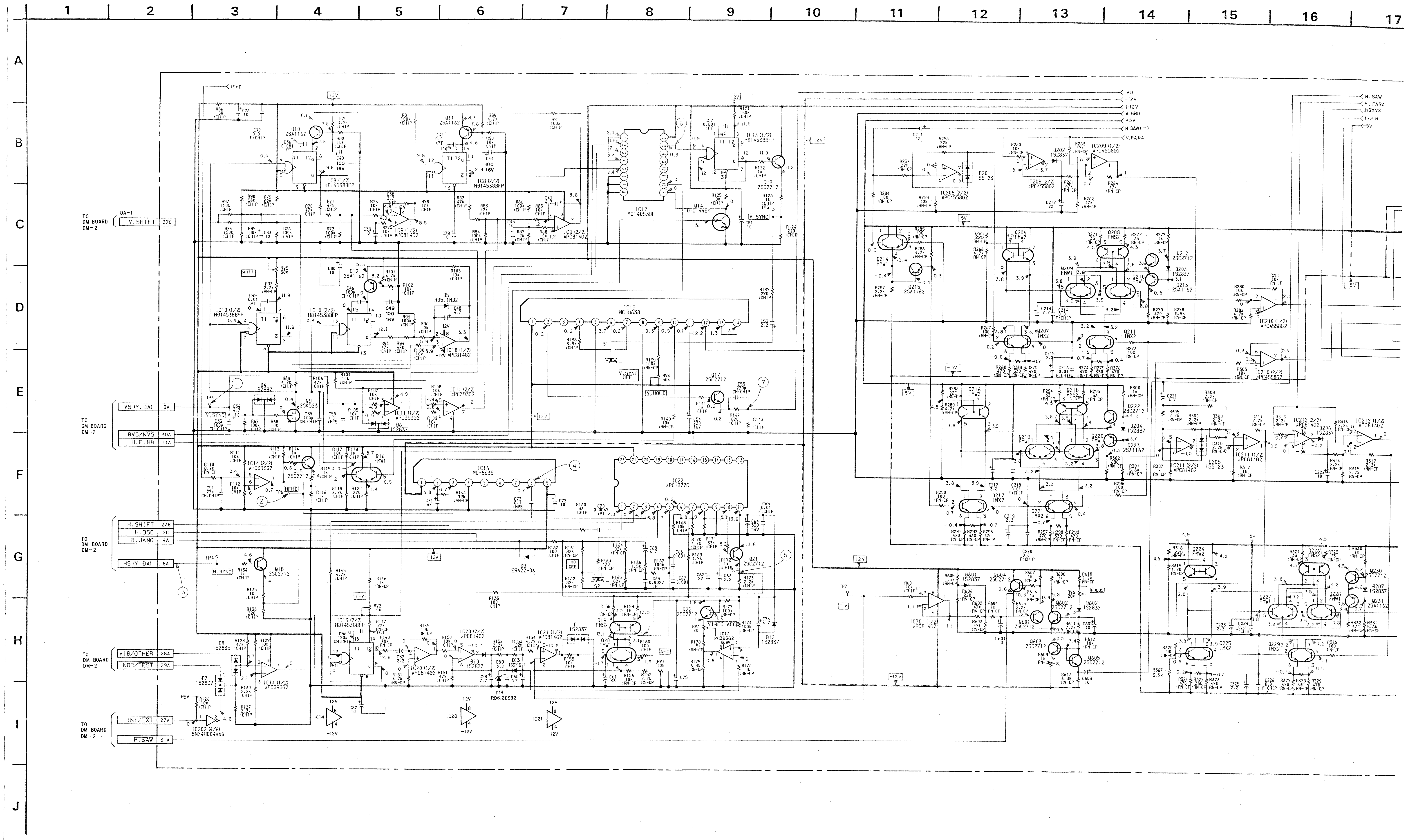
DA BOARD (CONDUCTOR SIDE)

IC	
IC1	F-3
IC2	F-1
IC3	D-6
IC5	C-5
IC8	D-4
IC10	C-3
IC13	C-1
IC15	A-7
IC16	F-2
IC22	E-2
IC201	D-8
IC213	C-10

TRANSISTOR	
Q1	B-2
Q2	D-6
Q3	E-6
Q4	E-6
Q5	C-8
Q6	C-9
Q7	B-6
Q8	C-6
Q9	E-5
Q10	C-4
Q11	E-4
Q12	C-2
Q13	C-1
Q14	B-1
Q15	B-2
Q17	A-7
Q18	F-6
Q21	E-3
Q201	B-2
Q202	B-2
Q203	B-7
Q204	C-7
Q205	C-7
Q212	C-13
Q213	C-13
Q215	C-12
Q222	C-11
Q223	C-10
Q230	C-9
Q231	C-9
Q233	E-13
Q235	E-13
Q237	D-12
Q239	D-13
Q401	F-10
Q402	F-10
Q601	F-1
Q602	A-5
Q603	A-5
Q604	F-2
Q605	A-5
Q707	B-8
Q708	B-8
Q801	A-2
Q802	F-4
Q803	F-6
Q804	F-6

DIODE	
D1	F-3
D2	F-1
D9	F-4
D11	D-1
D13	D-2
D14	C-2

VARIABLE RESISTOR	
RV1	A-2
RV2	A-3
RV3	A-3
RV4	A-4
RV5	A-4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A
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D
E
F
G
H
I
J
TO DM BOARD DM-2
DA-1
V.SHIFT 27C
VS (Y.BA) 9A
BVS/NVS 30A
H.F.HB 11A
H.SHIFT 27B
H.OSC 7C
+B.JANG 4A
HS (Y.BA) 8A
VID/OTHER 28A
NOR/TEST 29A
INT/EXT 27A
H.SAW 31A
HFHD
VD
-12V
+12V
A GND
+5V
H SAW(-)
V.PARA
H.SAW
H.PARA
HSXVS
1/2 H
-5V
12V
5V
IC8 (1/2) HD14538BFP
IC8 (2/2) HD14538BFP
IC9 (1/2) μPC814G2
IC9 (2/2) μPC814G2
IC10 (1/2) HD14538BFP
IC10 (2/2) HD14538BFP
IC11 (1/2) μPC393G2
IC11 (2/2) μPC393G2
IC12 MC14053BF
IC13 (1/2) HD14538BFP
IC13 (2/2) HD14538BFP
IC14 (1/2) μPC393G2
IC14 (2/2) μPC393G2
IC14 MC-8639
IC15 MC-8638
IC17 PC393G2
IC18 (1/2) μPC814G2
IC20 (1/2) μPC814G2
IC20 (2/2) μPC814G2
IC21 (1/2) μPC814G2
IC22 μPC1377C
IC202 (4/6) SN74HC04ANS
IC208 (2/2) μPC4558G2
IC209 (1/2) μPC4558G2
IC209 (2/2) μPC4558G2
IC210 (1/2) μPC4558G2
IC210 (2/2) μPC4558G2
IC211 (1/2) μPC814G2
IC211 (2/2) μPC814G2
IC212 (1/2) μPC814G2
IC212 (2/2) μPC814G2
IC701 (1/2) μPC814G2
Q10 2SA1162
Q11 2SA1162
Q12 2SA1162
Q13 2SC2712
Q14 DTC144EK
Q15 2SC2712
Q16 FMW1
Q17 2SC2712
Q18 2SC2712
Q19 FMS2
Q20 FMW1
Q21 2SC2712
Q22 2SC2712
Q9 2SK523
D4 1S2837
D5 RD5.1MB2
D6 1S2837
D7 1S2837
D8 1S2835
D9 ERA22-06
D10 1S2837
D11 1S2837
D12 1S2837
D13 1SS119
D14 RD6.2ESB2
D201 1SS123
D202 1S2837
D203 1S2837
D204 1S2837
D205 1SS123
D206 1S2837
D207 1S2837
Q204 FMW2
Q207 IMX2
Q208 FMS2
Q209 FMW1
Q210 FMW1
Q211 IMX2
Q212 2SC2712
Q213 2SA1162
Q214 FMW1
Q215 2SA1162
Q216 FMW2
Q217 IMX2
Q218 FMS2
Q219 FMW1
Q220 FMW1
Q221 IMX2
Q222 2SC2712
Q223 2SA1162
Q224 FMW2
Q225 IMX2
Q226 FMS2
Q227 FMW1
Q229 IMX2
Q230 2SC2712
Q231 2SA1162
Q601 2SC2712
Q602 2SC2712
Q603 2SC2712
Q604 2SC2712
Q605 2SC2712
D601 1S2837
D602 1S2837
RV1
RV2
RV3
RV4 50k
RV5 50k
RV6 20k
SHIFT
V.SYNC
V.SYNC OFF
V.HOLD
H.SYNC
HFHD
HD OFF
VIDEO AFC
AFC
FOCUS
F-V
S1
S2
TP3
TP4
TP5
TP6
TP7
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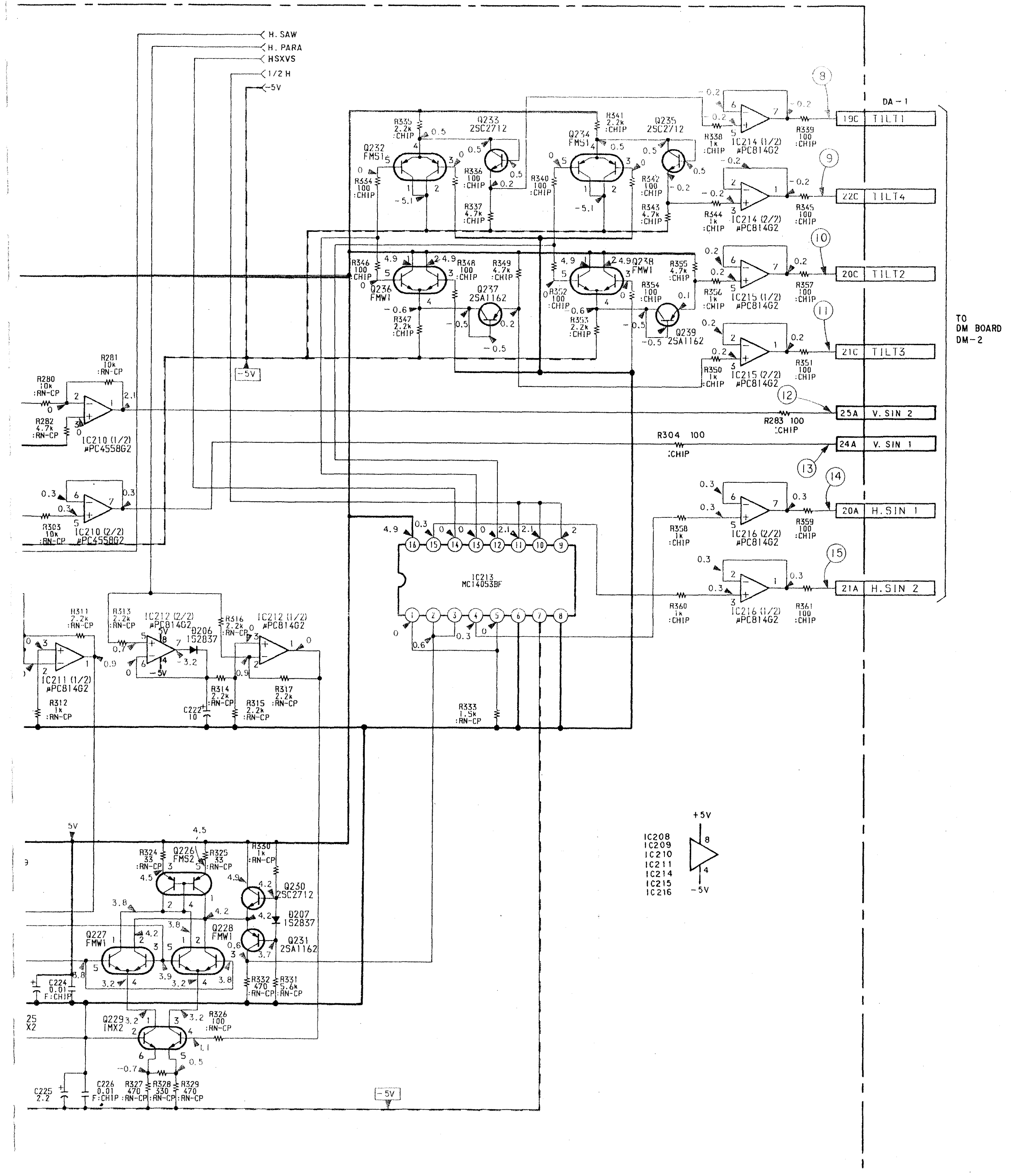
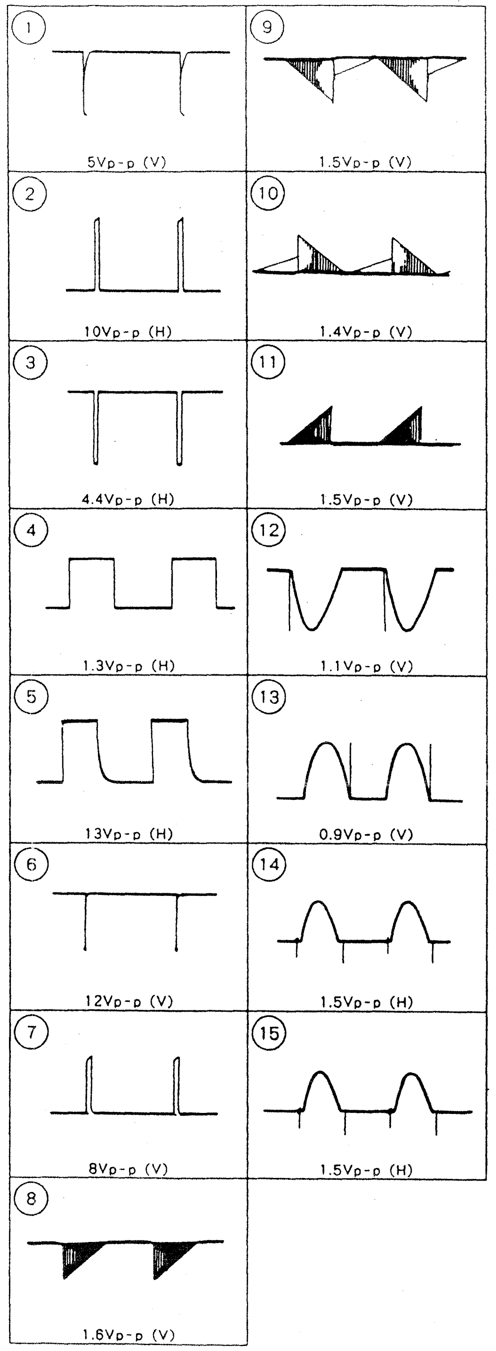
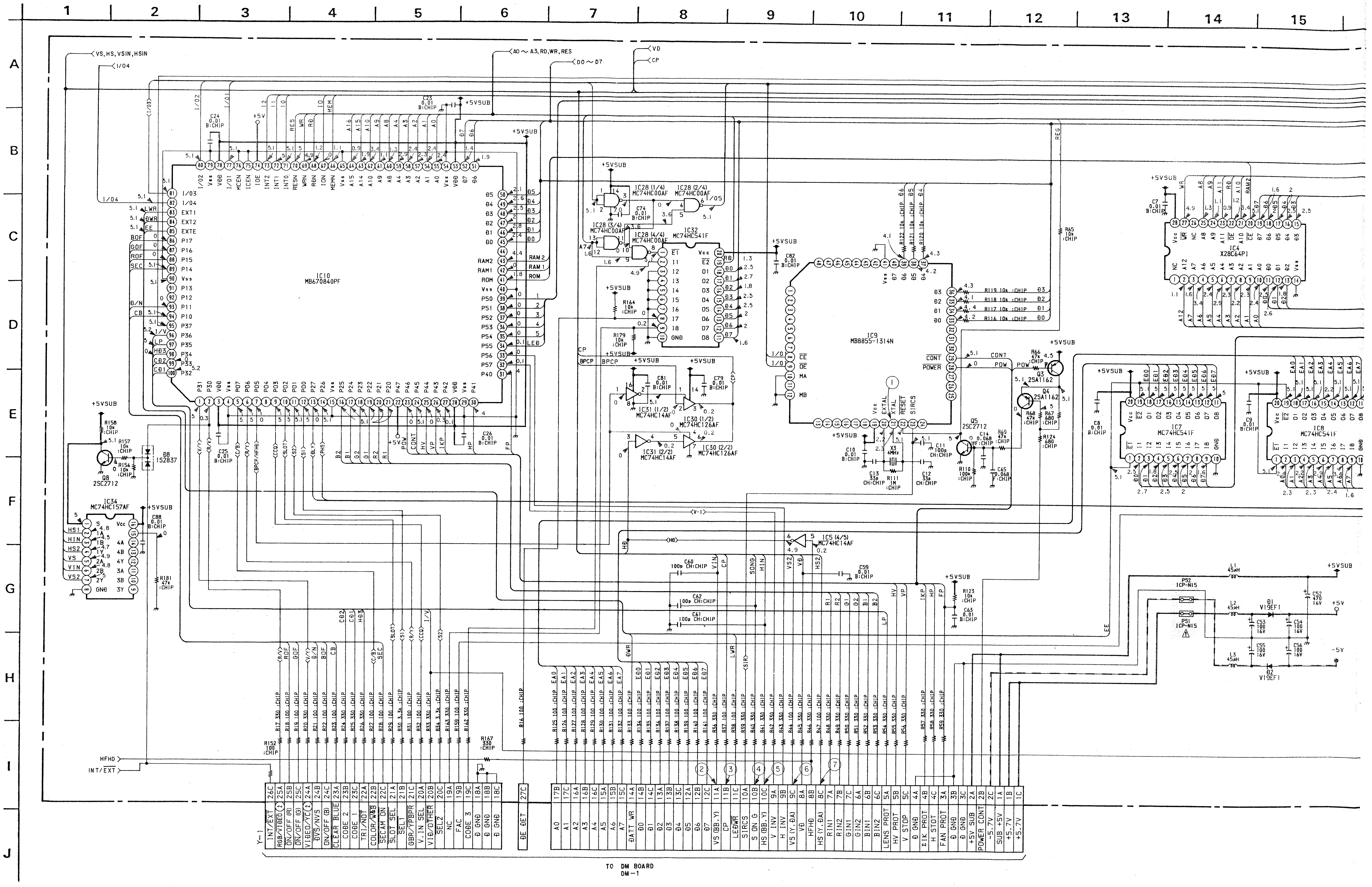

H. SAW
H. PARA
HSXVS
1/2 H
-5V
DA-1
19C TILT1
22C TILT4
20C TILT2
21C TILT3
25A V.SIN 2
24A V.SIN 1
20A H.SIN 1
21A H.SIN 2
TO DM BOARD DM-2
Q232 FMS1
Q233 2SC2712
Q234 FMS1
Q235 2SC2712
Q236 FMW1
Q237 2SA1162
Q238 FMW1
Q239 2SA1162
IC214 (1/2) μPC814G2
IC214 (2/2) μPC814G2
IC215 (1/2) μPC814G2
IC215 (2/2) μPC814G2
IC216 (1/2) μPC814G2
IC216 (2/2) μPC814G2
IC210 (1/2) μPC4558G2
IC210 (2/2) μPC4558G2
IC211 (1/2) μPC814G2
IC212 (1/2) μPC814G2
IC212 (2/2) μPC814G2
IC213 MC14053BF
D206 1S2837
D207 1S2837
Q226 FMS2
Q227 FMW1
Q228 FMW1
Q229 IMX2
Q230 2SC2712
Q231 2SA1162
R304 100 :CHIP
R283 100 :CHIP
IC208 IC209 IC210 IC211 IC214 IC215 IC216
+5V
-5V

D A(2/2) (LARGE WAVEFORM GENERATOR)

DA BOARD (2/2)



DA (2/2)	IC8	HD14538BFP	WIDE V. SHIFT GEN.	216	FMW2	V. SIN-1 MULTIPLEX-1
	9	μPC814G2	V. SHIFT LEVEL DET	217	IMX2	V. SIN-1 MULTIPLEX-2
	10	HD14538BFP	V. SHIFT GEN.	218	FMS2	V. SIN-1 MULTIPLEX-3
	11	μPC393G2	V. SHIFT PROT.	219	FMW1	V. SIN-1 MULTIPLEX-4
	12	MC14053BF	V. SYNC SW	220	FMW1	V. SIN-1 MULTIPLEX-5
	13	HD14538BFP	PULSE GEN.	221	IMX2	V. SIN-1 MULTIPLEX-6
	14	μPC393G2	SW	222	2SC2712	V. SIN-1 MULTIPLEX-7
	15	MC-8638	V. HOLD	223	2SA1162	V. SIN-1 MULTIPLEX-8
	16	MC-8639	H. SHIFT	224	FMW2	H. SIN MULTIPLEX-1
	17	μPC393G2	F-V DET	225	IMX2	H. SIN MULTIPLEX-2
	18	μPC814G2	V. SHIFT LEVEL COMP	226	FMS2	H. SIN MULTIPLEX-3
	20	μPC814G2	F-V CONV.	227	FMW1	H. SIN MULTIPLEX-4
	21	μPC814G2	F-V BUFF	228	FMW1	H. SIN MULTIPLEX-5
	22	μPC1377C	AFC	229	IMX2	H. SIN MULTIPLEX-6
	202	SN74HC04ANS	INV.	230	2SC2712	H. SIN MULTIPLEX-7
	208	μPC4558G2	V. SAW RECT.	231	2SA1162	H. SIN MULTIPLEX-8
	209	μPC4558G2	V. PARA BIAS	232	FMS1	TILT SW-1
	210	μPC4558G2	V. SIN BUFF	233	2SC2712	TILT SW-2
	211	μPC814G2	H. SAW RECT.	234	FMS1	TILT SW-3
	212	μPC814G2	H. PARA BIAS	235	2SC2712	TILT SW-4
	213	MC14053BF	H. SIN DEVIDER	236	FMW1	TILT SW-5
	214	μPC814G2	TILT BUFF-1	237	2SA1162	TILT SW-6
	215	μPC814G2	TILT BUFF-2	238	FMW1	TILT SW-7
	216	μPC814G2	H. SIN BUFF	239	2SA1162	TILT SW-8
	701	μPC814G2	BUFF	601	2SC2712	H. SAW GAIN CONT-1
				602	2SC2712	H. SAW GAIN CONT-2
	Q9	2SK523T	V. SYNC AMP	603	2SC2712	H. SAW GAIN CONT-3
	10	2SA1162	V-I CONV-4	604	2SC2712	H. SAW BUFF
	12	2SA1162	V-I CONV-6	605	2SC2712	THERM. CANCEL
	13	2SC2712	V. SYNC BUFF			
	14	DTC144EK	V. SHIFT SELECT	D4	1S2837	V. SYNC CLAMP
	15	2SC2712	HF•HD BUFF	5	RD5.1M-B2	LIMITTER
	16	FMW1	V. STOP PROT	6	1S2837	BIAS
	17	2SC2712	VD BUFF	7	1S2837	GATE-1
	18	2SC2712	H. SYNC BUFF	8	1S2835	GATE-2
	19	FMS2	CURRENT MIRROW-1	9	ERA22-06	H. OUT PROT
	20	FMW1	CURRENT MIRROW-2	10	1S2837	PEAK HOLD
	21	2SC2712	H. OSC BUFF	11	1S2837	SPEED UP
	22	2SC2712	THERM. CAHCEL	12	1S2837	DISCHARGE
	206	FMW2	V. SIN-2MULTIPLEX-1	13	1SS119	
	207	IMX2	V. SIN-2MULTIPLEX-2	14	RD6.2ESB2	
	208	FMS2	V. SIN-2MULTIPLEX-3	201	1SS123	V. SAW RECT.
	209	FMW1	V. SIN-2MULTIPLEX-4	202	1S2837	PEAK HOLD
	210	FMW1	V. SIN-2MULTIPLEX-5	203	1S2837	BIAS-1
	211	IMX2	V. SIN-2MULTIPLEX-6	204	1S2837	BIAS-2
	212	2SC2712	V. SIN-2MULTIPLEX-7	205	1SS123	H. SAW RECT.
	213	2SA1162	V. SIN-2MULTIPLEX-8	206	1S2837	PEAK HOLD
	214	FMW1	V. SAW LIMIT-1	601	1S2837	BIAS
	215	2SA1162	V. SAW LIMIT-2	602	1S2837	THERM. CANCEL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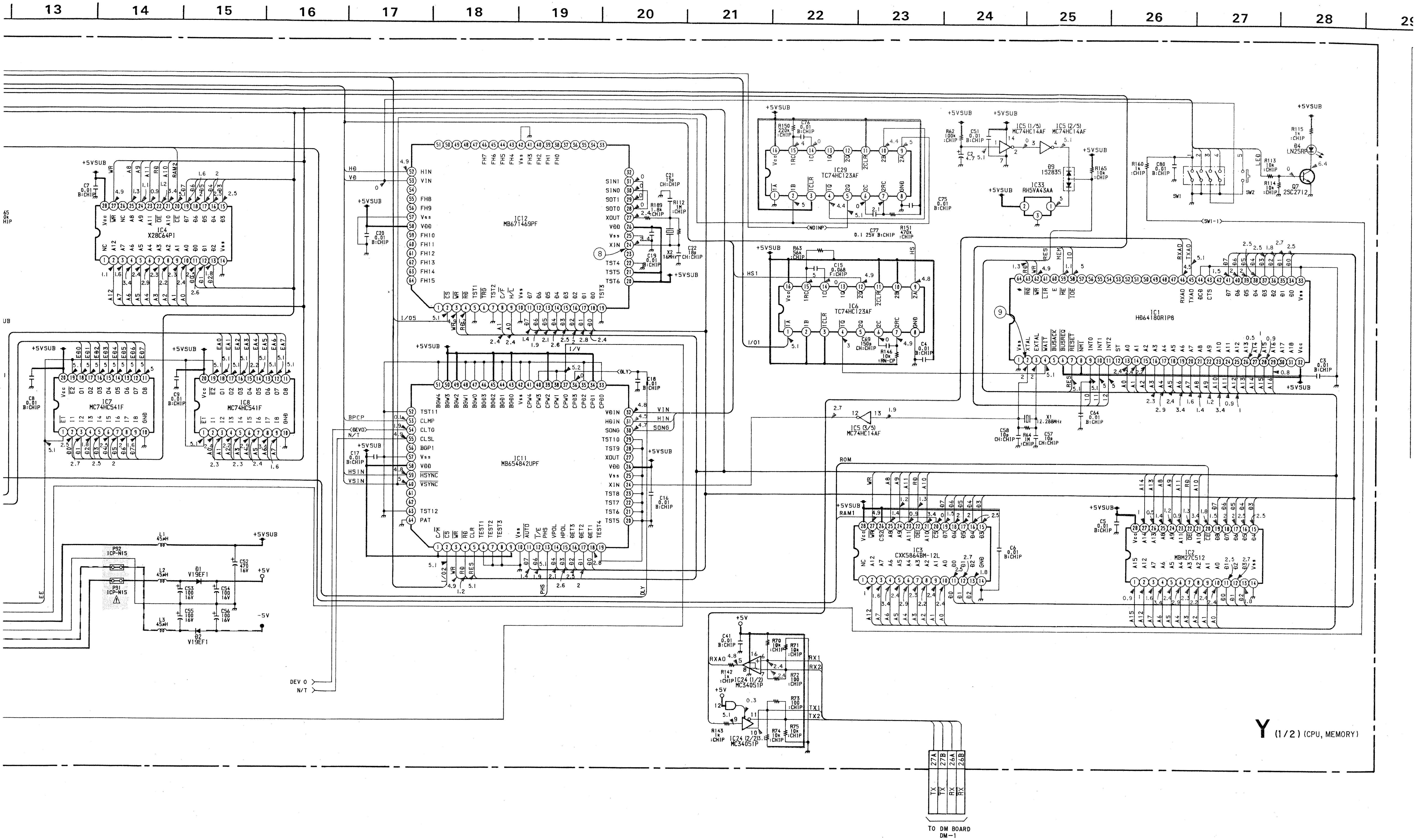
IC9 MB8855-1314N
IC4 X28C64P1
IC7 MC74HC541F
IC8 MC74HC541F
IC32 MC74HC541F
IC28 (1/4) MC74HC00AF
IC28 (2/4) MC74HC00AF
IC28 (3/4) MC74HC00AF
IC28 (4/4) MC74HC00AF
IC31 (1/2) MC74HC14AF
IC31 (2/2) MC74HC14AF
IC30 (1/2) MC74HC126AF
IC30 (2/2) MC74HC126AF
IC5 (4/5) MC74HC14AF
IC34 MC74HC157AF
Q8 2SC2712
Q3 2SA1162
Q4 2SA1162
Q5 2SC2712
D8 1S2837
D1 V19EF1
D2 V19EF1
PS1 ICP-N15
PS2 ICP-N15
X3 4MHz
+5VSUB
+5V
-5V
VS, HS, VSIN, HSIN
A0 ~ A3, RD, WR, RES
D0 ~ D7
VD
CP
HFHD
INT/EXT
TO DM BOARD DM-1
INT/EXT
RGB/VIDEO (1)
ON/OFF (R)
ON/OFF (G)
VIDEO/YC (2)
DVS/NVS
ON/OFF (B)
CLEAR BLUE
CODE 2
CODE 1
TRI/NOT
COLOR/W&B
SECAM ON
SLOT SEL
SEL1
GBR/YPBPR
V. IN SEL
VD/OTHER
SEL2
NC
FAC
CODE 3
D GND
DE DET
A0
A1
A2
A3
A4
A5
A6
A7
DATT WR
D0
D1
D2
D3
D4
D5
D6
D7
VS (BB. Y)
CP
LEDWR
SIRCS
S ON G
HS (BB. Y)
V INV
H INV
VS (Y. DA)
VD
HFHD
HS (Y. DA)
RIN1
RIN2
GIN1
GIN2
BIN1
BIN2
LENS PROT
HV PROT
V STOP
D GND
ΣIK PROT
H STOT
FAN PROT
+5V SUB
POWER CONT
-5.7V
SUB +5V
+5.7V
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J


13
14
15
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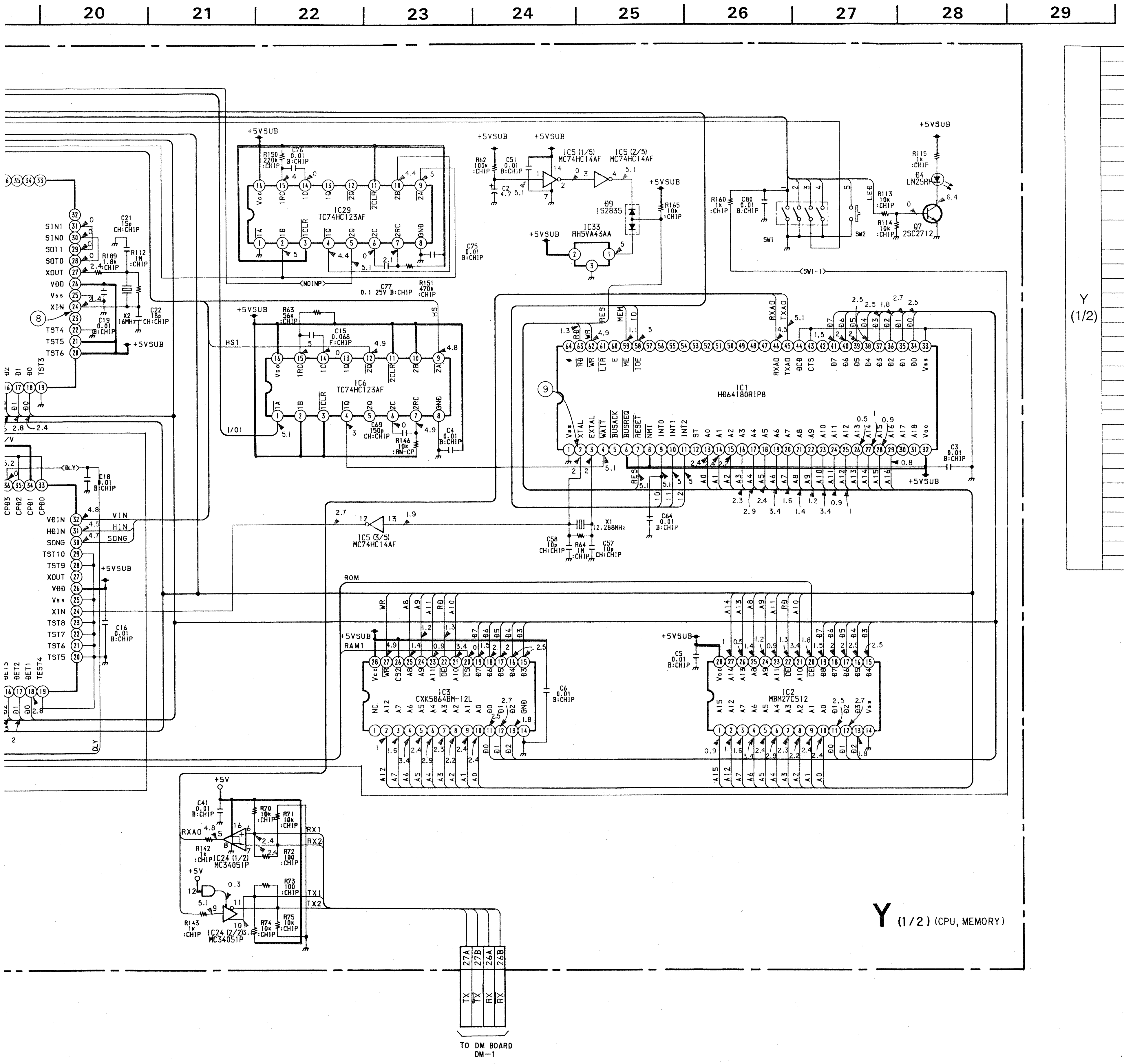
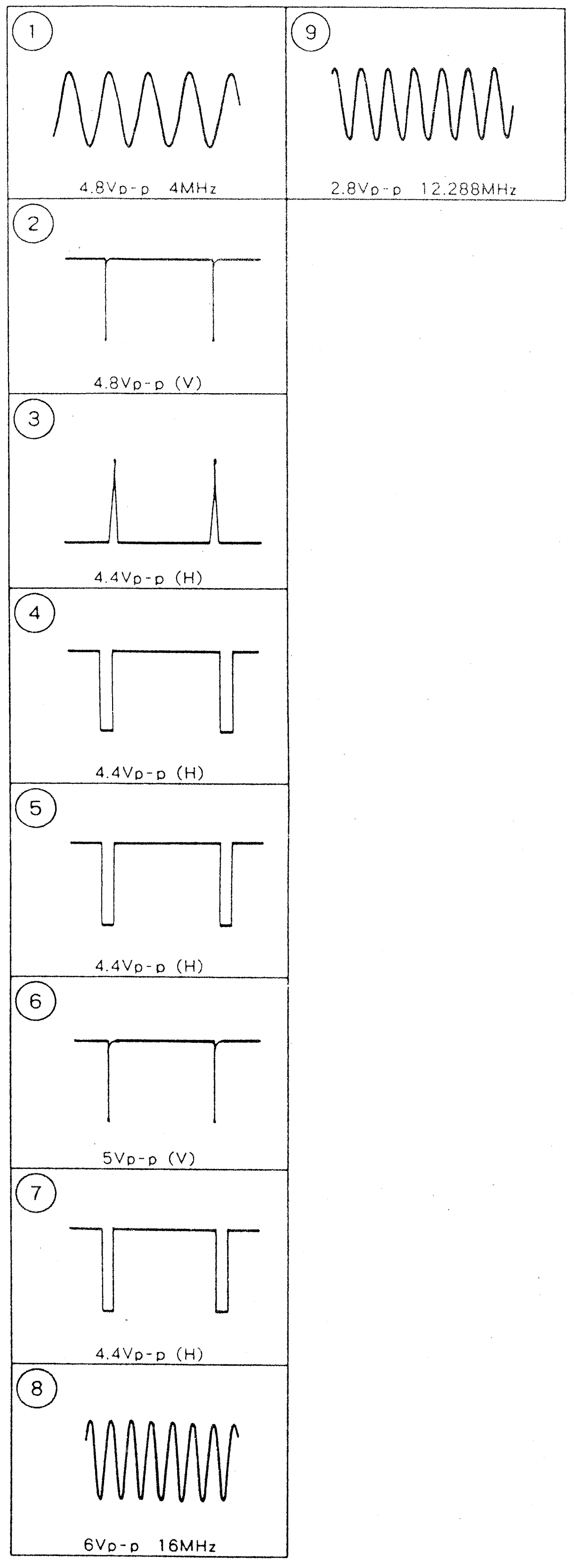
19
20
21
22
23
24
25
26
27
28
IC4 X28C64P1
IC7 MC74HC541F
IC8 MC74HC541F
IC12 MB671469PF
IC11 MB654842UPF
IC29 TC74HC123AF
IC6 TC74HC123AF
IC5 (1/5) MC74HC14AF
IC5 (2/5) MC74HC14AF
IC5 (3/5) MC74HC14AF
IC33 RH5VA43AA
D9 1S2835
D4 LN25RP
Q7 2SC2712
SW1
SW2
IC1 HD64180R1P8
IC3 CXK5864BM-12L
IC2 MBM27C512
IC24 (1/2) MC34051P
IC24 (2/2) MC34051P
PS2 ICP-N15
PS1 ICP-N15
D1 V19EF1
D2 V19EF1
L1 45μH
L2 45μH
L3 45μH
X1 12.288MHz
X2 16MHz
+5VSUB
+5V
-5V
DEV O
N/T
RAM1
ROM
TO DM BOARD DM-1
TX
TX
RX
RX
27A
27B
26A
26B

Y (1/2) (CPU, MEMORY)

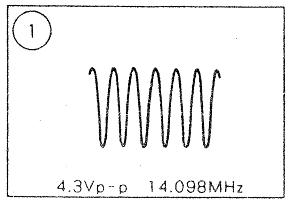

20
21
22
23
24
25
26
27
28
29
+5VSUB
IC29 TC74HC123AF
IC5 (1/5) MC74HC14AF
IC5 (2/5) MC74HC14AF
D9 1S2835
IC33 RH5VA43AA
IC6 TC74HC123AF
IC1 HD64180R1P8
IC5 (3/5) MC74HC14AF
X1 12.288MHz
X2 16MHz
D4 LN25RP
Q7 2SC2712
SW1
SW2
ROM
RAM1
IC3 CXK5864BM-12L
IC2 MBM27C512
IC24 (1/2) MC34051P
IC24 (2/2) MC34051P
RXAO
RX1
RX2
TX1
TX2
27A
27B
26A
26B
TX
TX
RX
RX
TO DM BOARD DM-1
Y (1/2) (CPU, MEMORY)

Y (1/2)	IC1	HD64180R1PB	CPU
	2	MBM27C512P	Program Rom
	3	CXK5864BM-12L	RAM
	4	X28C64PI	EE PROM.
	5	MC74HC14AF	Inverter
	6	TC74HC123AF	Wait control&reform, H-SYNC pulse
	7	MC74HC541F	Data Bus Buffer
	8	MC74HC541F	Address Bus Buffer
	9	MB8855-1314N	Sircs Decode
	10	MB670840PF	Address Encode/Parallel Interface/Interrupt Control
	11	MB654842UPF	SYNC Contorl& CLAMP Pulse Gen.
	12	MB671469PF	fH/fv detect
	24	MC34051P	RS422 line Driver/Reciver
	28	MC74HC00AF	Address Encode
	29	TC74HC123AF	V-SYNC Detect
	30	MC74HC126AF	Clamp pluse Select
	31	MC74HC14AF	Inverter
	32	MC74HC541F	In-port
	33	RH5VA43AA	CPU&SIRCS IC Reset
	34	MC74HC157AF	H-SYNC Select
	Q3	2SA1162	Power control Drive
	4	2SA1162	Power Down Detect
	5	2SC2712	Sircs IC Reset
	7	2SC2712	LED Drive
	8	2SC2712	Buffer
	D1	V19EF1	Voltage Drop Diode
	2	V19EF1	Voltage Drop Diode
	4	LN25RP	LED
	5	1S2835	OSC Kill
	8	1S2837	Diode OR for SYNC Sel
	9	1S2835	Diode AND for Reset

Y BOARD (1/2)

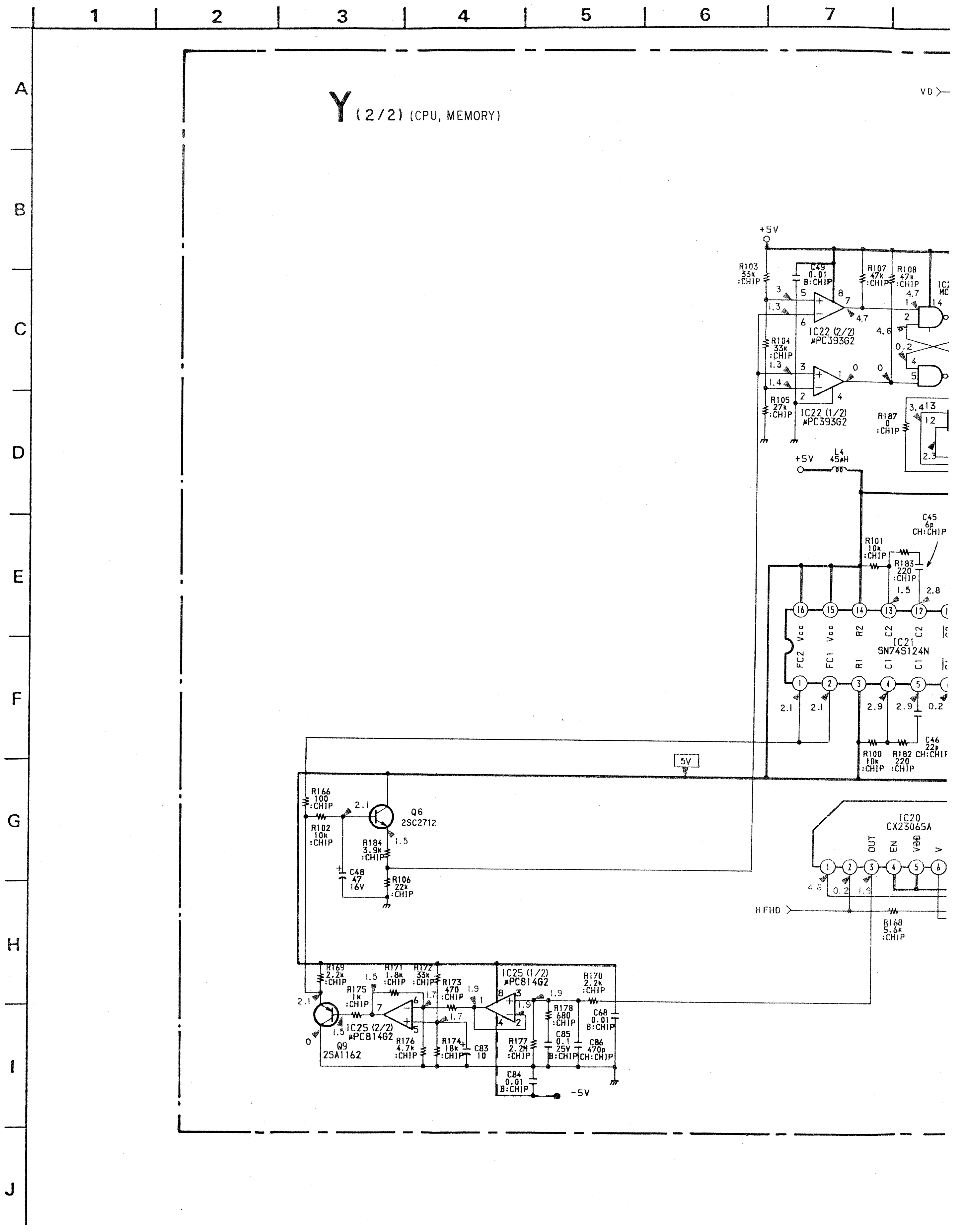


Y BOARD (2/2)

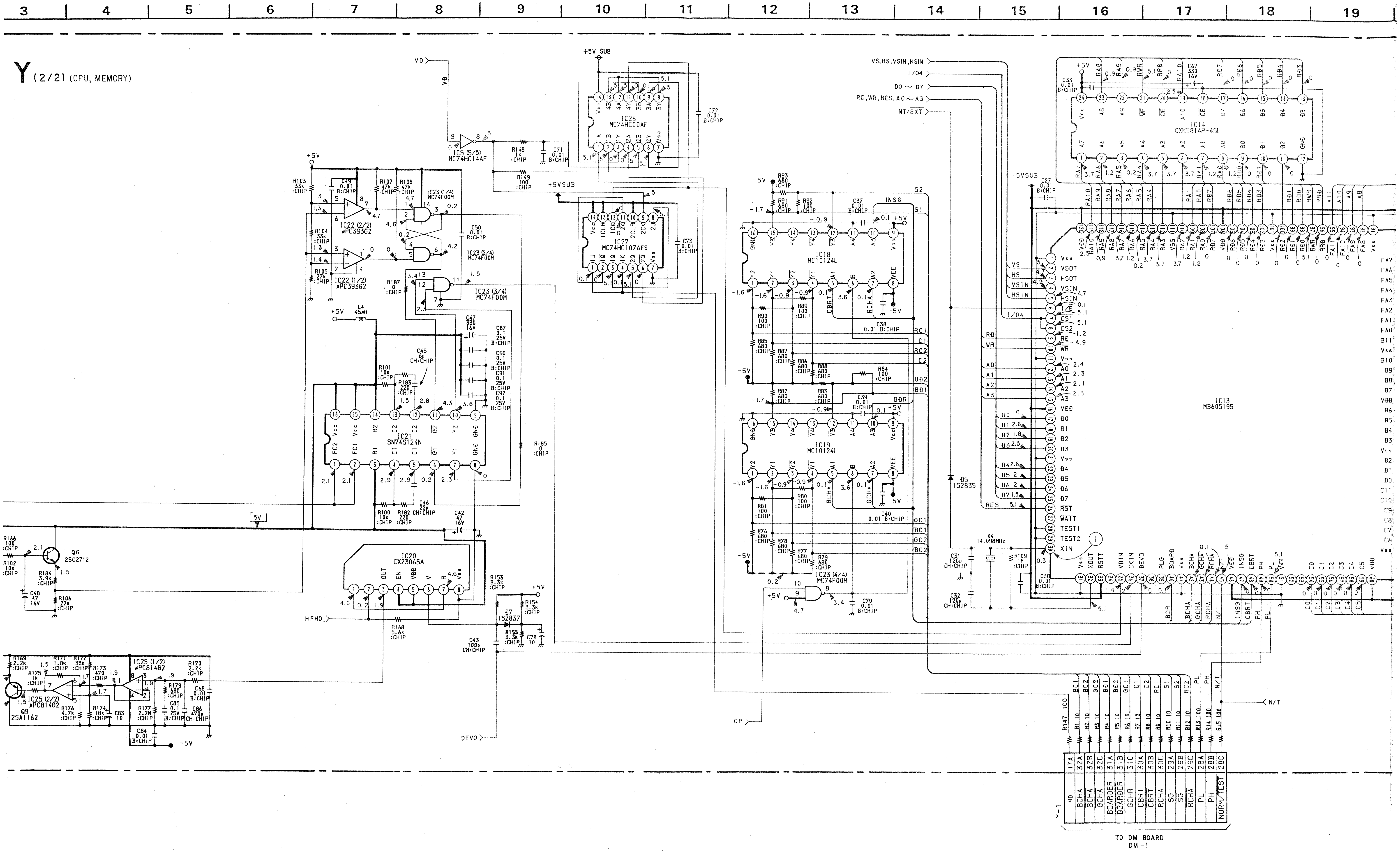


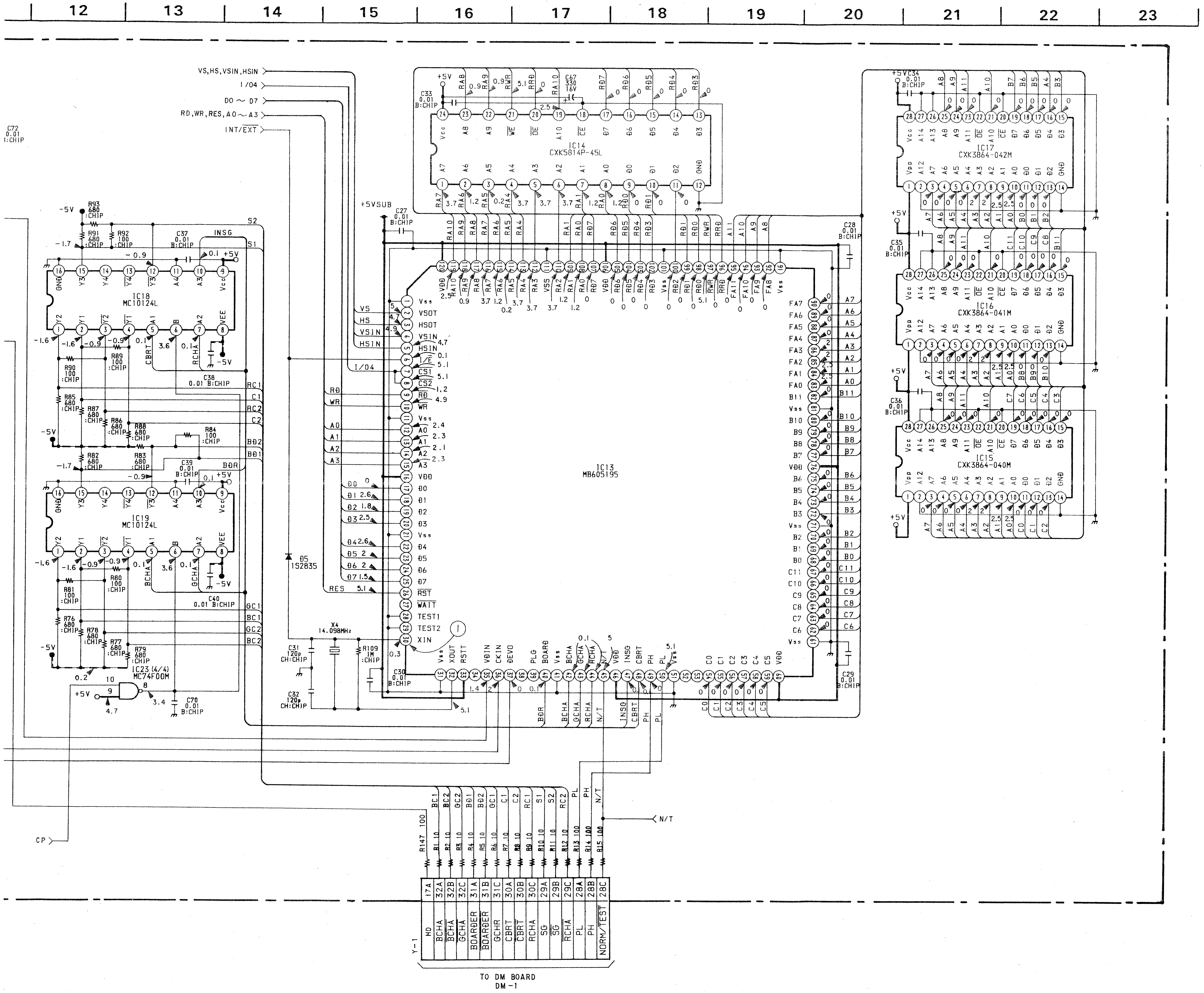
Note : INPUT SELECT button ON

Y (2/2)	IC13	MB605195	Character&Test pattern Gen.
	14	CXK5814P-45L	Character Display RAM
	15	CXK3864-040M	Character font ROM No.1
	16	CXK3864-041M	Character font ROM No.2
	17	CXK3864-042M	Character font ROM No.3
	18	MC10124L	Character&Test pattern signal,
	19	MC10124L	Character signal, TTL → ECL Translation
	20	CX23065A	Phase Comparater
	21	SN74S124N	Dual Voltage Controlled Osc.
	22	μPC393G2	Window Comparater
	23	MC74F00M	VCO Select
	25	μPC814G2	Voltage Comparater
	26	MC74HC00AF	VD Shift for Character Gen.
	27	SN74HC107ANS	VD Shift for Character Gen.
	Q6	2SC2712	Buffer
	9	2SA1162	Buffer
	D7	1S2835	Pulse Rect.


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
J
Y (2/2) (CPU, MEMORY)
VD
+5V
R103 33k :CHIP
C49 0.01 B:CHIP
R107 47k :CHIP
R108 47k :CHIP
IC22 (2/2) μPC393G2
R104 33k :CHIP
R105 27k :CHIP
IC22 (1/2) μPC393G2
R187 0 :CHIP
+5V
L4 45μH
C45 6p CH:CHIP
R101 10k :CHIP
R183 220 :CHIP
IC21 SN74S124N
FC2
Vcc
FC1
Vcc
R2
R1
C2
C1
R100 10k :CHIP
R182 220 :CHIP
C46 22p CH:CHIP
5V
R166 100 :CHIP
R102 10k :CHIP
Q6 2SC2712
R184 3.9k :CHIP
C48 47 16V
R106 22k :CHIP
IC20 CX23065A
OUT
EN
VDD
HFHD
R168 5.6k :CHIP
R169 2.2k :CHIP
R175 1k :CHIP
R171 1.8k :CHIP
R172 33k :CHIP
R173 470 :CHIP
IC25 (1/2) μPC814G2
R170 2.2k :CHIP
IC25 (2/2) μPC814G2
Q9 2SA1162
R176 4.7k :CHIP
R174 18k :CHIP
C83 10
R177 2.2M :CHIP
R178 680 :CHIP
C85 0.1 25V B:CHIP
C86 470p CH:CHIP
C68 0.01 B:CHIP
C84 0.01 B:CHIP
-5V

Y (2/2) (CPU, MEMORY)


3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
VD
+5V SUB
IC26 MC74HC00AF
C72 0.01 B:CHIP
IC5 (5/5) MC74HC14AF
R148 1k :CHIP
C71 0.01 B:CHIP
R149 100 :CHIP
+5VSUB
IC27 MC74HC107AFS
C73 0.01 B:CHIP
+5V
R103 33k :CHIP
C49 0.01 B:CHIP
R107 47k :CHIP
R108 47k :CHIP
IC23 (1/4) MC74F00M
IC22 (2/2) μPC393G2
C50 0.01 B:CHIP
IC23 (2/4) MC74F00M
R104 33k :CHIP
IC22 (1/2) μPC393G2
R105 27k :CHIP
R187 0 :CHIP
IC23 (3/4) MC74F00M
L4 45μH
C47 330 16V
C87 0.1 25V B:CHIP
C90 0.1 25V B:CHIP
C91 0.1 25V B:CHIP
C92 0.1 25V B:CHIP
C45 6p CH:CHIP
R101 10k :CHIP
R183 220 :CHIP
IC21 SN74S124N
R185 0 :CHIP
R100 10k :CHIP
R182 220 :CHIP
C46 22p CH:CHIP
C42 47 16V
5V
R166 100 :CHIP
R102 10k :CHIP
Q6 2SC2712
R184 3.9k :CHIP
C48 47 16V
R106 22k :CHIP
IC20 CX23065A
R153 3.3k :CHIP
R154 3.3k :CHIP
D7 1S2837
R155 3.3k :CHIP
C78 10
HFHD
R168 5.6k :CHIP
C43 100p CH:CHIP
DEVO
R169 2.2k :CHIP
R171 1.8k :CHIP
R172 33k :CHIP
R173 470 :CHIP
R175 1k :CHIP
IC25 (1/2) μPC814G2
R170 2.2k :CHIP
IC25 (2/2) μPC814G2
R176 4.7k :CHIP
R174 18k :CHIP
C83 10
R178 680 :CHIP
C68 0.01 B:CHIP
R177 2.2M :CHIP
C85 0.1 25V B:CHIP
C86 470p CH:CHIP
Q9 2SA1162
C84 0.01 B:CHIP
-5V
VS,HS,VSIN,HSIN
I/O4
D0 ～ D7
RD,WR,RES,A0～A3
INT/EXT
-5V
R93 680 :CHIP
R91 680 :CHIP
R92 100 :CHIP
C37 0.01 B:CHIP
INSG
S2
S1
IC18 MC10124L
R90 100 :CHIP
R89 100 :CHIP
C38 0.01 B:CHIP
R85 680 :CHIP
R87 680 :CHIP
R86 680 :CHIP
R88 680 :CHIP
R84 100 :CHIP
R82 680 :CHIP
R83 680 :CHIP
C39 0.01 B:CHIP
IC19 MC10124L
R81 100 :CHIP
R80 100 :CHIP
C40 0.01 B:CHIP
R76 680 :CHIP
R78 680 :CHIP
R77 680 :CHIP
R79 680 :CHIP
IC23 (4/4) MC74F00M
C70 0.01 B:CHIP
CP
RC1
C1
RC2
C2
BD2
BD1
BDR
GC1
BC1
GC2
BC2
C33 0.01 B:CHIP
C67 330 16V
IC14 CXK5814P-45L
C27 0.01 B:CHIP
IC13 MB605195
D5 1S2835
X4 14.098MHz
C31 120p CH:CHIP
R109 1M :CHIP
C32 120p CH:CHIP
C30 0.01 B:CHIP
VS
HS
VSIN
HSIN
I/O4
RD
WR
A0
A1
A2
A3
RES
N/T
R147 100
R1 10
R2 10
R3 10
R4 10
R5 10
R6 10
R7 10
R8 10
R9 10
R10 10
R11 10
R12 10
R13 100
R14 100
R15 100
17A 32A 32B 32C 31A 31B 31C 30B 30C 29A 29B 29C 28A 28B 28C
HD BCHA BCHA GCHA BOARDER BOARDER GCHR CBRT RCHA SG SG RCHA PL PH NORM/TEST
Y-1
TO DM BOARD DM-1


12
13
14
15
16
17
18
19
20
21
22
23
VS,HS,VSIN,HSIN
I/O4
D0 ~ D7
RD,WR,RES,A0 ~ A3
INT/EXT
C72 0.01 :CHIP
IC14 CXK5814P-45L
C33 0.01 B:CHIP
C67 330 16V
+5VSUB
C27 0.01 B:CHIP
IC18 MC10124L
IC19 MC10124L
R93 680 :CHIP
R91 680 :CHIP
R92 100 :CHIP
C37 0.01 B:CHIP
INSG
S1
S2
C38 0.01 B:CHIP
C39 0.01 B:CHIP
C40 0.01 B:CHIP
RC1
C1
RC2
C2
BD2
BD1
BDR
GC1
BC1
GC2
BC2
IC23 (4/4) MC74F00M
C70 0.01 B:CHIP
CP
D5 1S2835
X4 14.098MHz
C31 120p CH:CHIP
C32 120p CH:CHIP
R109 1M :CHIP
C30 B:CHIP
IC13 MB605195
C28 0.01 B:CHIP
C29 0.01 B:CHIP
IC17 CXK3864-042M
IC16 CXK3864-041M
IC15 CXK3864-040M
C34 0.01 B:CHIP
C35 0.01 B:CHIP
C36 0.01 B:CHIP
N/T
R147 100
R1 10
R2 10
R3 10
R4 10
R5 10
R6 10
R7 10
R8 10
R9 10
R10 10
R11 10
R12 10
R13 100
R14 100
R15 100
Y-1
17A HD
32A BCHA
32B BCHA
32C GCHA
31A BOARDER
31B BOARDER
31C GCHR
30A CBRT
30B CBRT
30C RCHA
29A SG
29B SG
29C RCHA
28A PL
28B PH
28C NORM/TEST
TO DM BOARD DM-1

]

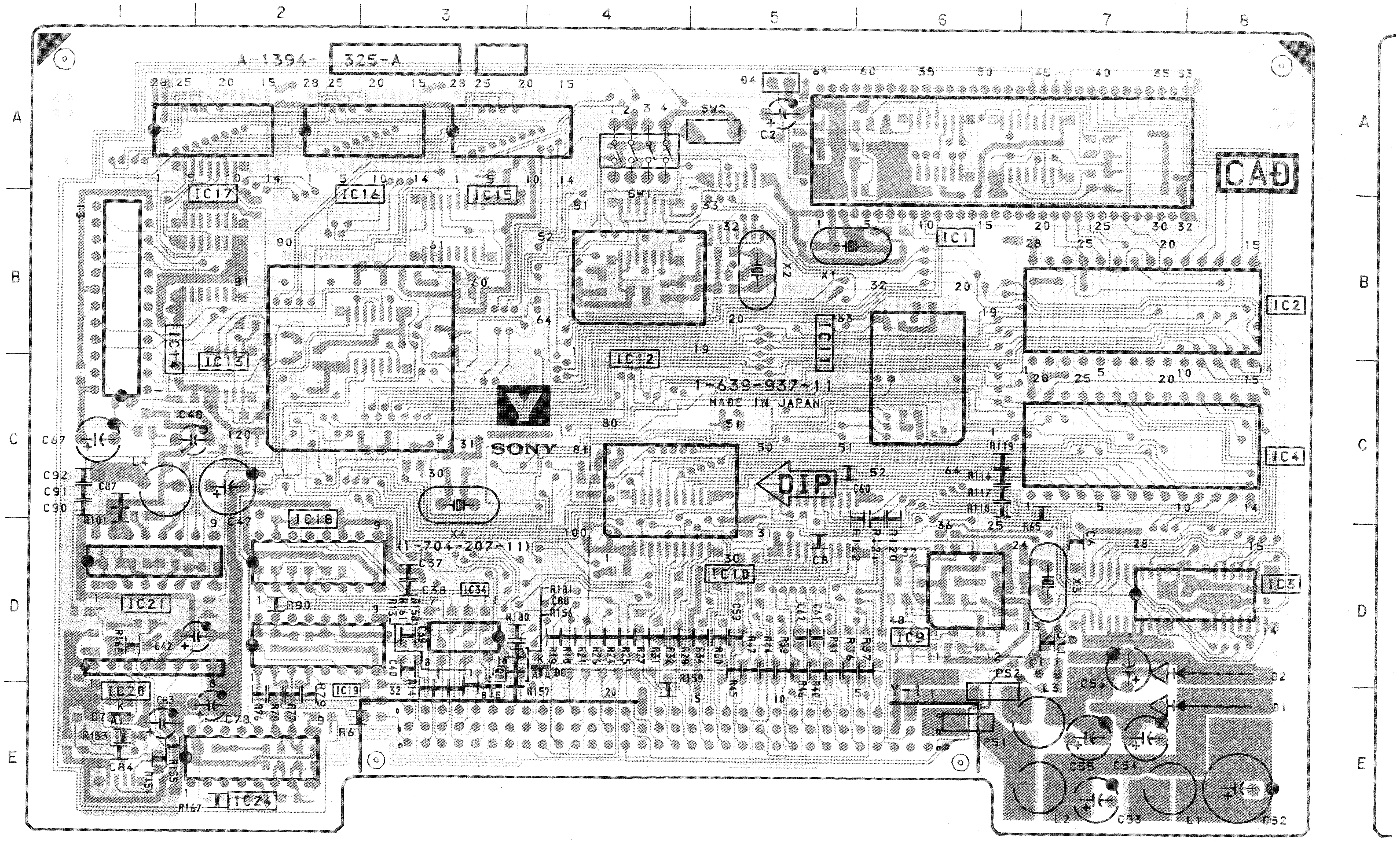
Y [CPU MEMORY]

Y BOARD (COMPONENT SIDE)

IC	
IC1	A-6
IC2	B-8
IC3	D-8
IC4	C-8
IC9	D-6
IC10	C-4
IC11	C-6
IC12	B-4
IC13	C-2
IC14	B-1
IC15	A-3
IC16	A-2
IC17	A-2
IC18	D-2
IC19	D-2
IC20	D-1
IC21	D-1
IC24	E-2
IC34	D-3
TRANSISTOR	
Q8	D-3
DIODE	
D1	E-8
D2	D-8
D4	A-5
D7	E-1
D8	D-4

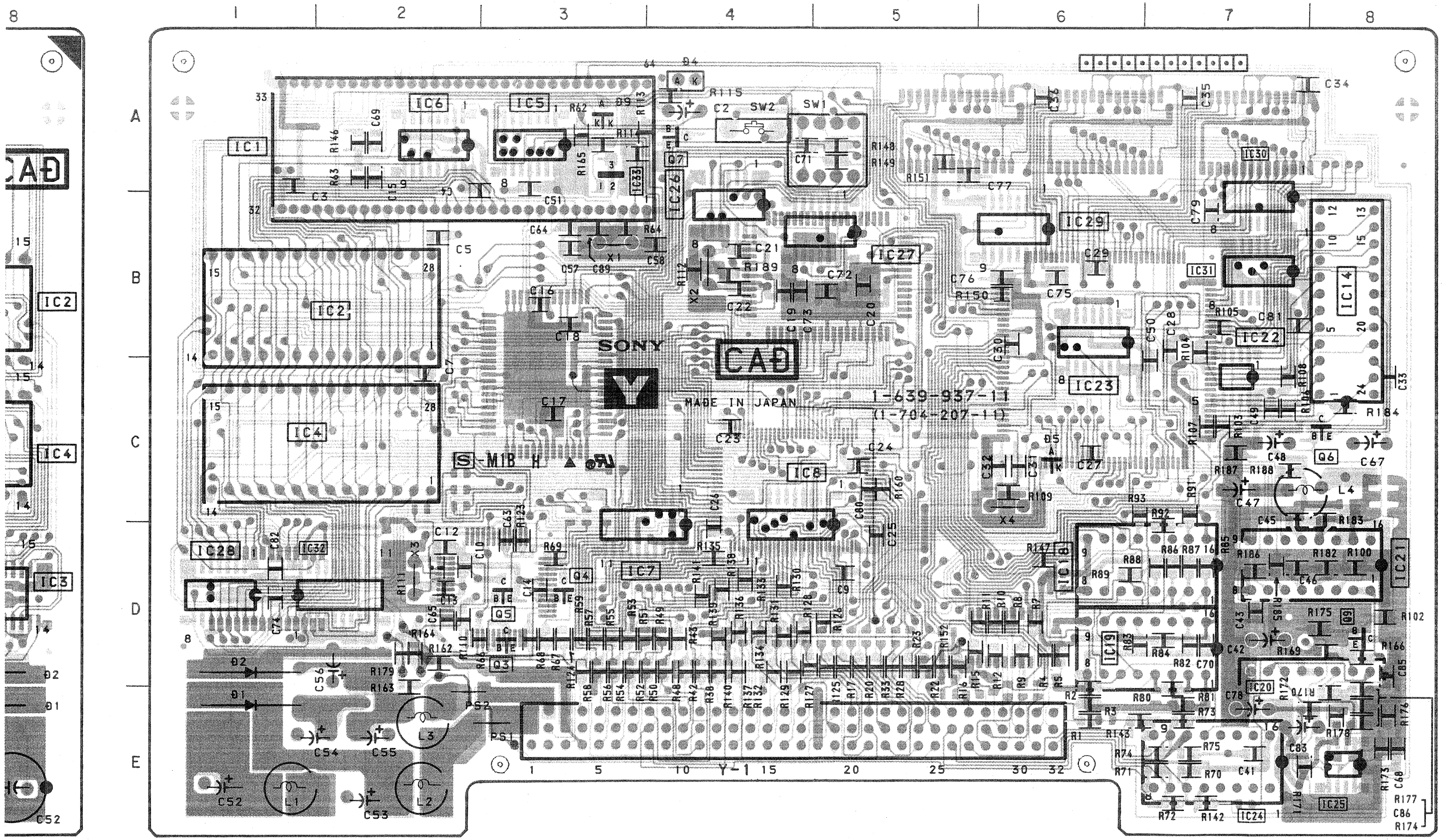
– Y BOARD –

-COMPONENT SIDE-


1
2
3
4
5
6
7
8
A
B
C
D
E
A-1394-325-A
1-639-937-11
MADE IN JAPAN
(1-704-207-11)
SONY
Y
CAD
DIP
IC1
IC2
IC3
IC4
IC9
IC10
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC18
IC19
IC20
IC21
IC24
IC34
SW1
SW2
D4
C2
X1
X2
X3
X4
C67
C48
C92
C91
C90
C87
R101
L4
C47
C37
C38
R90
R161
R158
R13
C39
C40
R14
R181
C88
R156
R180
R157
R19
R18
R21
R26
R24
R25
R27
R31
R32
R29
R34
R30
R159
R47
R44
R39
R45
R46
R40
R41
R36
R37
C59
C62
C61
C60
C8
C6
R122
R121
R120
R119
R116
R117
R118
R65
C42
R160
C83
C78
R76
R78
R77
R79
R6
D7
R153
C84
R155
R154
R167
Y-1
PS1
PS2
L1
L2
L3
C52
C53
C54
C55
C56
D1
D2

– Y BOARD –

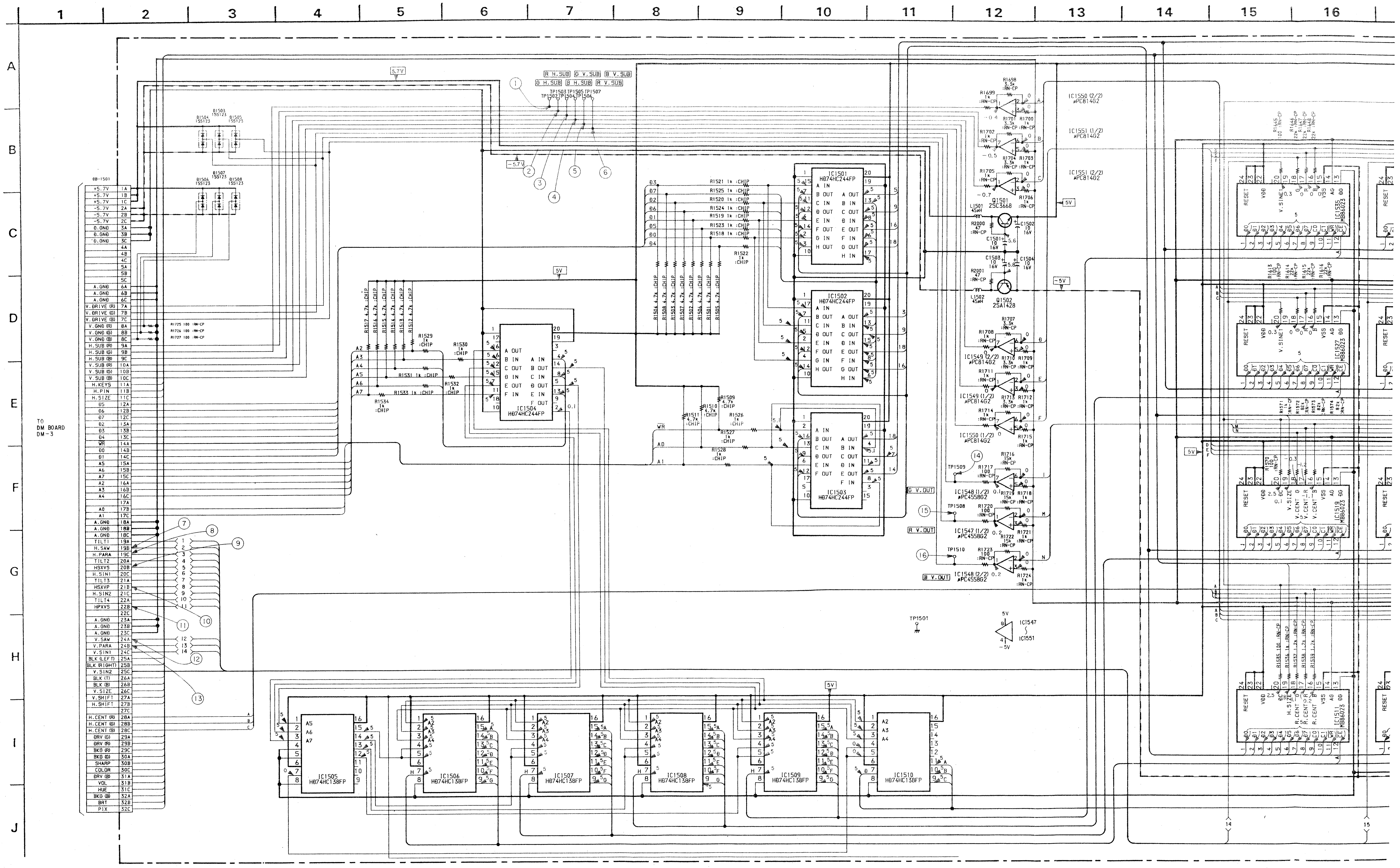
– CONDUCTOR SIDE –


1
2
3
4
5
6
7
8
A
B
C
D
E
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC14
IC18
IC19
IC20
IC21
IC22
IC23
IC24
IC25
IC26
IC27
IC28
IC29
IC30
IC31
IC32
IC33
CAD
SONY
MADE IN JAPAN
1-639-937-11
(1-704-207-11)
S-M1B H
SW1
SW2
X1
X2
X3
X4
Q3
Q4
Q5
Q6
Q7
Q9
D1
D2
D4
D5
D9
L1
L2
L3
L4
PS1
PS2
C52
C53
C54
C55
C56
Y-1

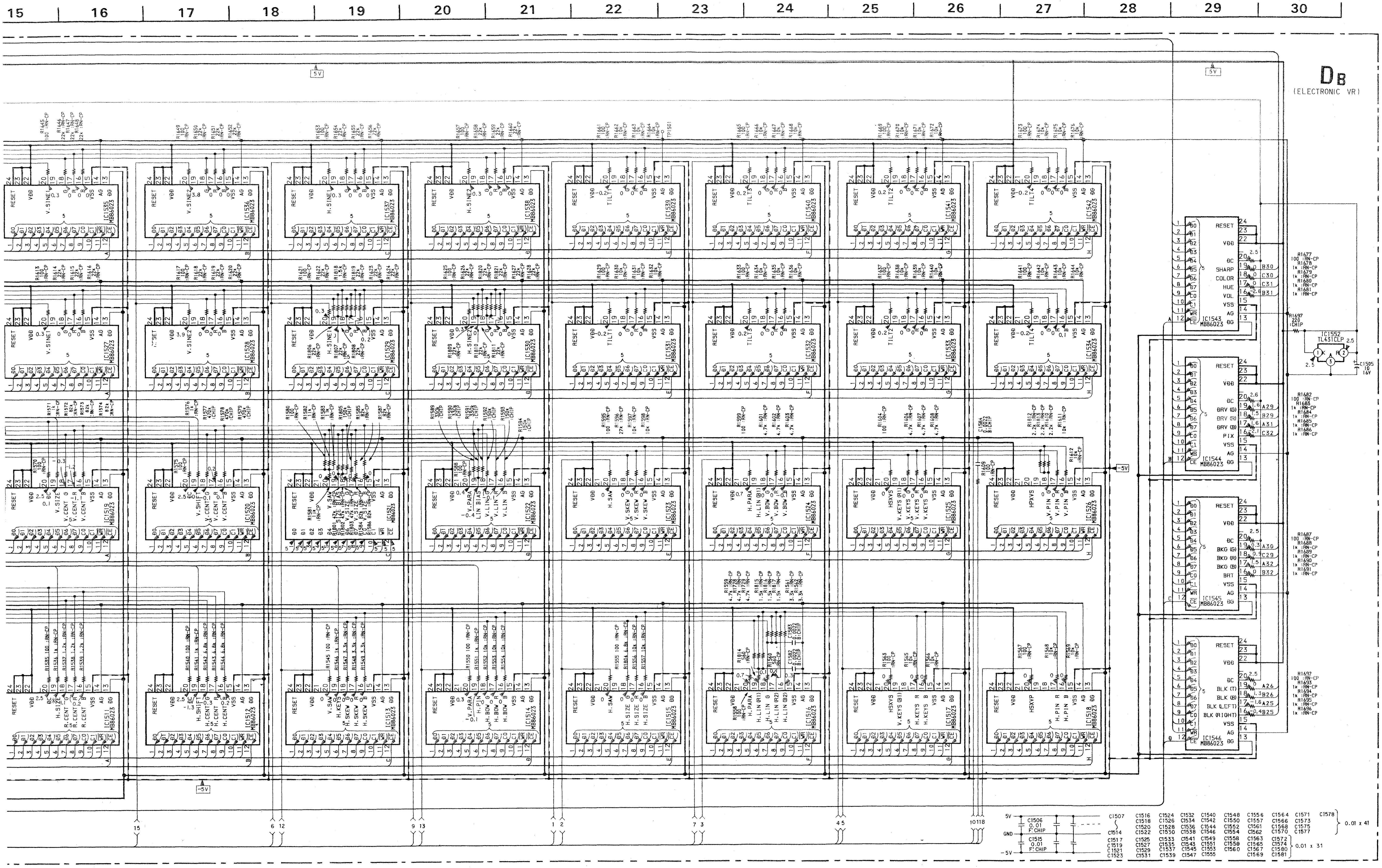
Y BOARD (CONDUCTOR SIDE)

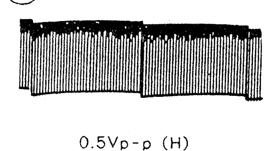
IC	
IC1	A-1
IC2	B-2
IC4	C-1
IC5	A-3
IC6	A-2
IC7	D-3
IC8	C-4
IC14	B-8
IC18	D-6
IC19	D-6
IC20	D-7
IC21	D-8
IC22	C-7
IC23	B-6
IC24	E-7
IC25	E-8
IC26	B-4
IC27	B-5
IC28	D-1
IC29	B-6
IC30	B-7
IC31	B-7
IC32	D-2
IC33	A-3
TRANSISTOR	
Q3	D-3
Q4	D-3
Q5	D-3
Q6	C-8
Q7	A-4
Q9	D-8
DIODE	
D1	E-1
D2	D-1
D4	A-4
D5	C-6
D9	A-3

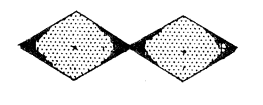
- ░ : Pattern from the side which enables seeing.
- ▒ : Pattern of the rear side.
- ▓ : Pattern of second and third layer.

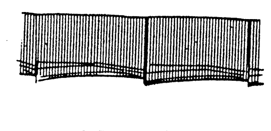


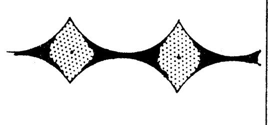
CB-1501
TO DM BOARD DM-3
IC1501 HD74HC244FP
IC1502 HD74HC244FP
IC1503 HD74HC244FP
IC1504 HD74HC244FP
IC1505 HD74HC138FP
IC1506 HD74HC138FP
IC1507 HD74HC138FP
IC1508 HD74HC138FP
IC1509 HD74HC138FP
IC1510 HD74HC138FP
IC1550 (2/2) μPC814G2
IC1551 (1/2) μPC814G2
IC1551 (2/2) μPC814G2
IC1549 (2/2) μPC814G2
IC1549 (1/2) μPC814G2
IC1550 (1/2) μPC814G2
IC1548 (1/2) μPC4558G2
IC1547 (1/2) μPC4558G2
IC1548 (2/2) μPC4558G2
IC1535 MB86023
IC1527 MB86023
IC1519 MB86023
IC1511 MB86023
Q1501 2SC3668
Q1502 2SA1428
D1503 1SS123
D1504 1SS123
D1505 1SS123
D1506 1SS123
D1507 1SS123
D1508 1SS123
TP1501
TP1508
TP1509
TP1510
R H.SUB
G V.SUB
B V.SUB
G H.SUB
B H.SUB
R V.SUB
G V.OUT
R V.OUT
B V.OUT
5.7V
-5.7V
5V
-5V

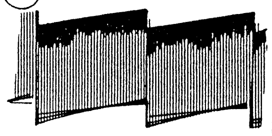

15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
DB
(ELECTRONIC VR)
5V
-5V
IC1535 MB86023
IC1536 MB86023
IC1537 MB86023
IC1538 MB86023
IC1539 MB86023
IC1540 MB86023
IC1541 MB86023
IC1542 MB86023
IC1527 MB86023
IC1528 MB86023
IC1529 MB86023
IC1530 MB86023
IC1531 MB86023
IC1532 MB86023
IC1533 MB86023
IC1534 MB86023
IC1519 MB86023
IC1520 MB86023
IC1521 MB86023
IC1522 MB86023
IC1523 MB86023
IC1524 MB86023
IC1525 MB86023
IC1526 MB86023
IC1511 MB86023
IC1512 MB86023
IC1513 MB86023
IC1514 MB86023
IC1515 MB86023
IC1516 MB86023
IC1517 MB86023
IC1518 MB86023
IC1543 MB86023
IC1544 MB86023
IC1545 MB86023
IC1546 MB86023
IC1552 TL431CLP
RESET
VDD
VSS
AG
DG
V.SINE1
V.SINE2
H.SINE1
H.SINE2
TILT1
TILT2
TILT3
TILT4
V.SIZE
V.SHIFT
V.CENT G
V.CENT R
V.CENT B
H.SAW
V.PARA
LIN BIAS
V.LIN
V.SKEW
H.PARA
H.LIN
V.BOW
HSXVS
V.KEYS
HPVVS
V.PIN
H.SIZE
R.CENT
H.CENT
H.KEYS
H.SKEW
H.PIN
H.BOW
HSXVP
SHARP
COLOR
HUE
VOL
DRV (G)
DRV (R)
DRV (B)
PIX
BKG (G)
BKG (R)
BKG (B)
BRT
BLK (T)
BLK (B)
BLK (LEFT)
BLK (RIGHT)
C1506 0.01 F CHIP
C1515 0.01 F CHIP
GND
0.01 x 41
0.01 x 31

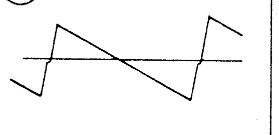
①

0.5Vp-p (H)

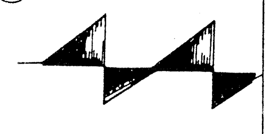
⑨

2.9Vp-p (V)

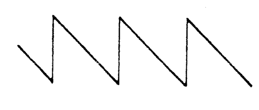
②

0.5Vp-p (H)

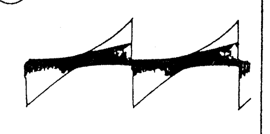
⑩

1.8Vp-p (V)

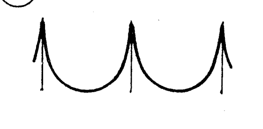
③

0.7Vp-p (H)

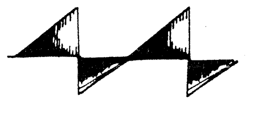
⑪

2.5Vp-p (V)

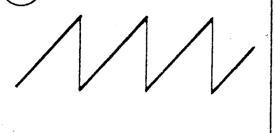
④

0.7Vp-p (V)

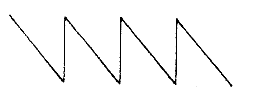
⑫

2.4Vp-p (V)

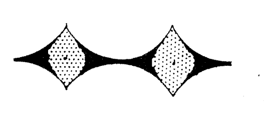
⑤

1Vp-p (V)

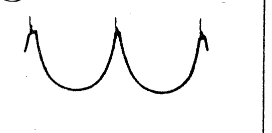
⑬

1.5Vp-p (V)

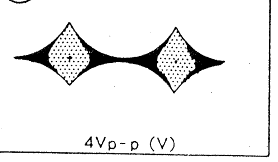
⑥

0.76Vp-p (V)

⑭

3.9Vp-p (V)

⑦

3Vp-p (H)

⑮

3.9Vp-p (V)

⑧

2.4Vp-p (H)

⑯

4Vp-p (V)

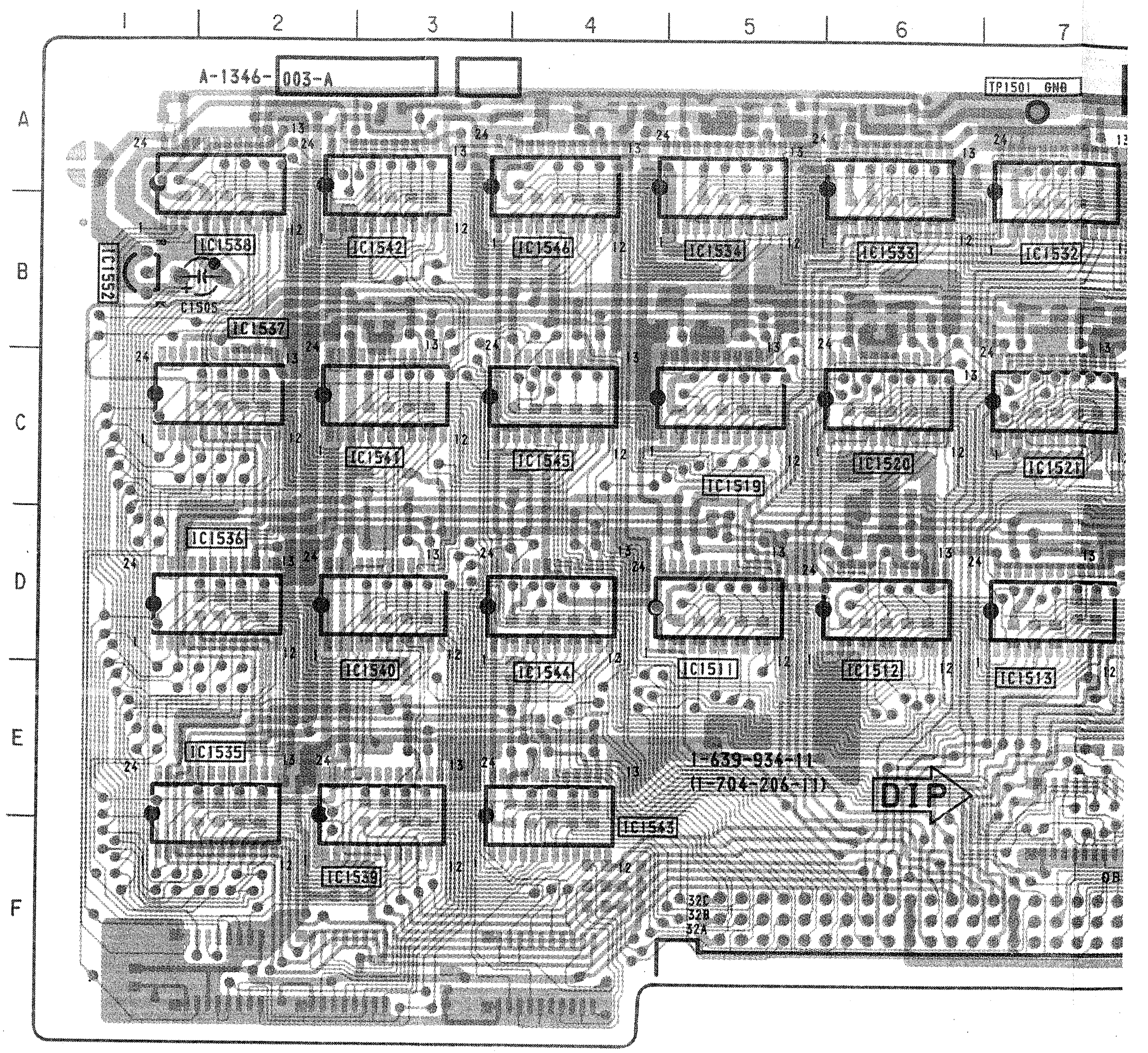
DB	IC1501	HD74HC244FP	DATA BUS BUFF-1
	1502	HD74HC244FP	DATA BUS BUFF-2
	1503	HD74HC244FP	ADDRESS BUS BUFF-1
	1504	HD74HC244FP	ADDRESS BUS BUFF-2
	1505	HD74HC138FP	ADDRESS DECODE-1
	1506	HD74HC138FP	ADDRESS DECODE-2
	1507	HD74HC138FP	ADDRESS DECODE-3
	1508	HD74HC138FP	ADDRESS DECODE-4
	1509	HD74HC138FP	ADDRESS DECODE-5
	1510	HD74HC138FP	ADDRESS DECODE-6
	1511	MB86023	H CENT. CONT-1
	1512	MB86023	H CENT. CONT-2
	1513	MB86023	H.SKEW CONT
	1514	MB86023	H.BOW CONT
	1515	MB86023	H.SIZE CONT
	1516	MB86023	H.LIN CONT
	1517	MB86023	H.KEYS CONT
	1518	MB86023	H.PIN CONT
	1519	MB86023	V CENT. CONT-1
	1520	MB86023	V CENT. CONT-2
	1521	MB86023	V.SIZE CONT
	1522	MB86023	V.LIN CONT
	1523	MB86023	V.SKEW CONT
	1524	MB86023	V.BOW CONT
	1525	MB86023	V.KEYS CONT
	1526	MB86023	V.PIN CONT
	1527	MB86023	H. ZONE CONT-1
	1528	MB86023	H. ZONE CONT-2
	1529	MB86023	H. ZONE CONT-3
	1530	MB86023	H. ZONE CONT-4
	1531	MB86023	H. ZONE CONT-5
	1532	MB86023	H. ZONE CONT-6
	1533	MB86023	H. ZONE CONT-7
	1534	MB86023	H. ZONE CONT-8
	1535	MB86023	V. ZONE CONT-1
	1536	MB86023	V. ZONE CONT-2
	1537	MB86023	V. ZONE CONT-3
	1538	MB86023	V. ZONE CONT-4
	1539	MB86023	V. ZONE CONT-5
	1540	MB86023	V. ZONE CONT-6
	1541	MB86023	V. ZONE CONT-7
	1542	MB86023	V. ZONE CONT-8
	1543	MB86023	USER CONT
	1544	MB86023	DRV. CONT
	1545	MB86023	BKG CONT
	1546	MB86023	BLK CONT
	1547	μPC4558G2	V.OUT-1
	1548	μPC4558G2	V.OUT-2
	1549	μPC814G2	SUB OUT-1
	1550	μPC814G2	SUB OUT-2
	1551	μPC814G2	SUB OUT-3
	1552	TL431CLP	+2.5V reg
	Q1501	2SC3668	+5.7V LIPPLE FILTER
	1502	2SA1428O	–5.7V LIPPLE FILTER
	D1503	1SS123	PROT-1
	1504	1SS123	PROT-2
	1505	1SS123	PROT-3
	1506	1SS123	PROT-4
	1507	1SS123	PROT-5
	1508	1SS123	PROT-6

DB BOARD (COMPONENT SIDE)

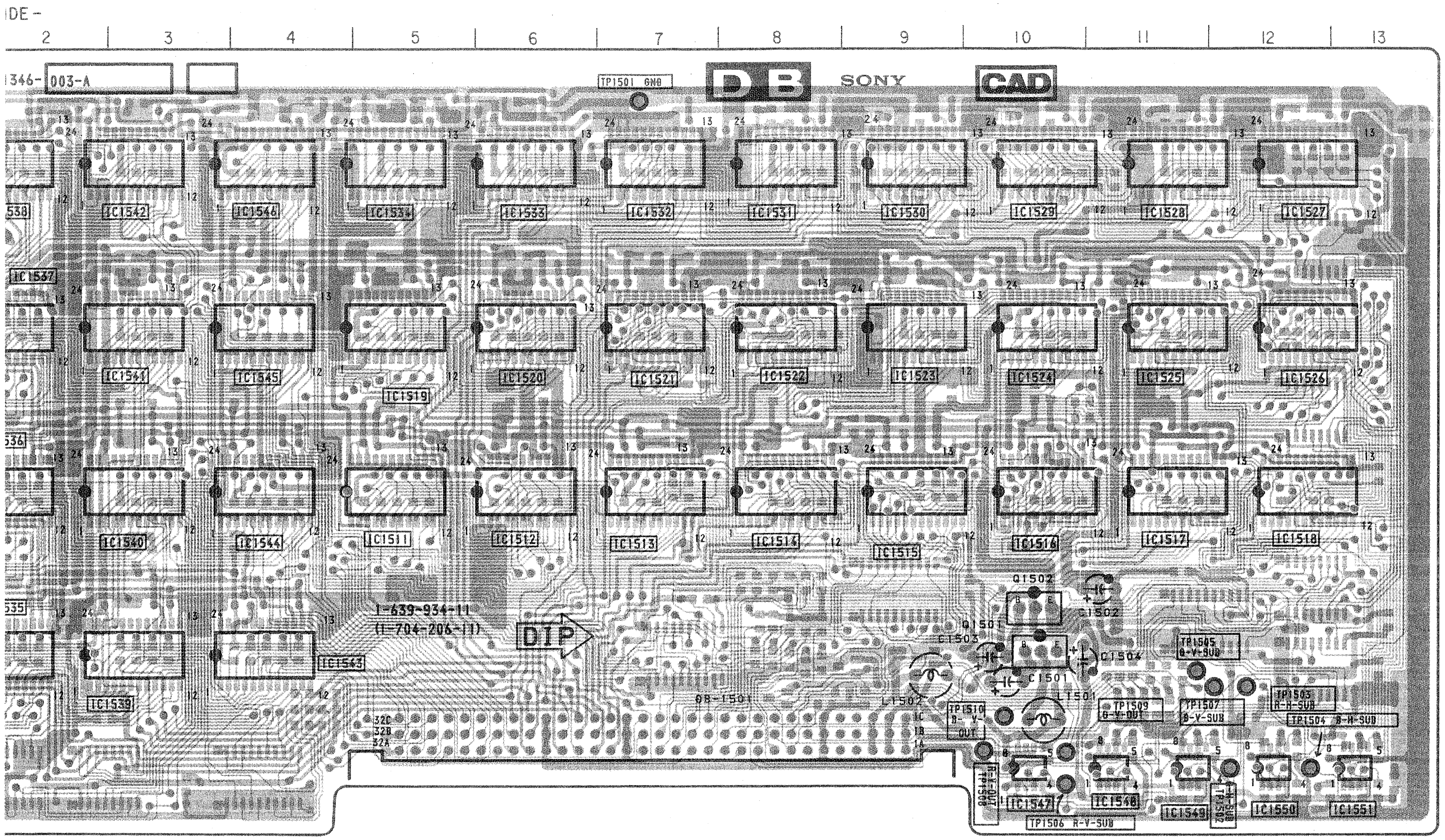
IC	
IC1511	D-5
IC1512	D-6
IC1513	D-7
IC1514	D-8
IC1515	D-9
IC1516	D-10
IC1517	D-11
IC1518	D-12
IC1519	C-5
IC1520	C-6
IC1521	C-7
IC1522	C-8
IC1523	C-9
IC1524	C-10
IC1525	C-11
IC1526	C-12
IC1527	A-12
IC1528	A-11
IC1529	A-10
IC1530	A-9
IC1531	A-8
IC1532	A-7
IC1533	A-6
IC1534	A-5
IC1535	E-2
IC1536	D-2
IC1537	C-2
IC1538	A-2
IC1539	E-3
IC1540	D-3
IC1541	C-3
IC1542	A-3
IC1543	E-4
IC1544	D-4
IC1545	C-4
IC1546	A-4
IC1547	F-10
IC1548	F-11
IC1549	F-11
IC1550	F-12
IC1551	F-13
IC1552	B-1
TRANSISTOR	
Q1501	E-10
Q1502	E-10

– DB BOARD –

-COMPONENT SIDE-

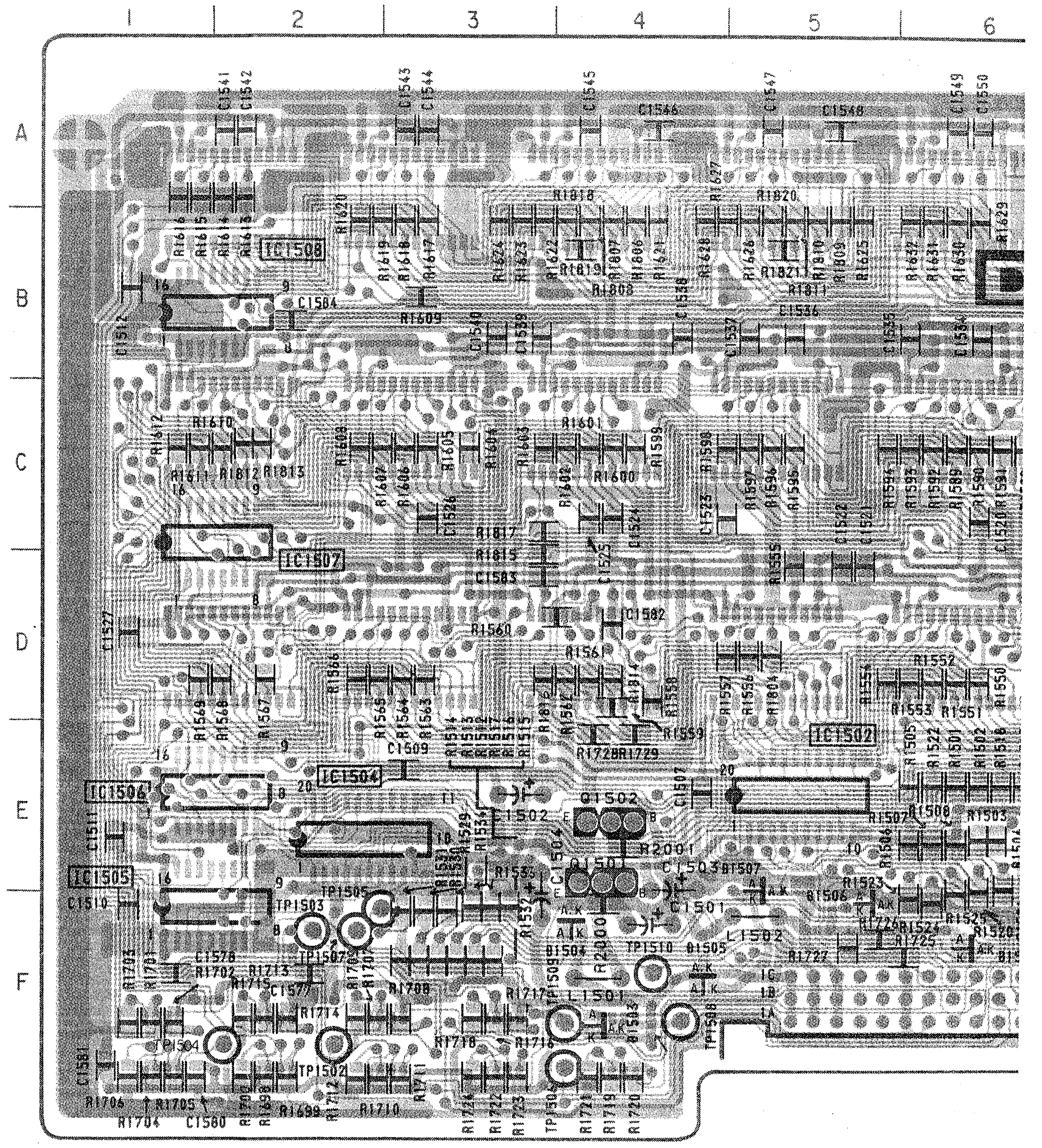


DB [ELECTRONIC VR]

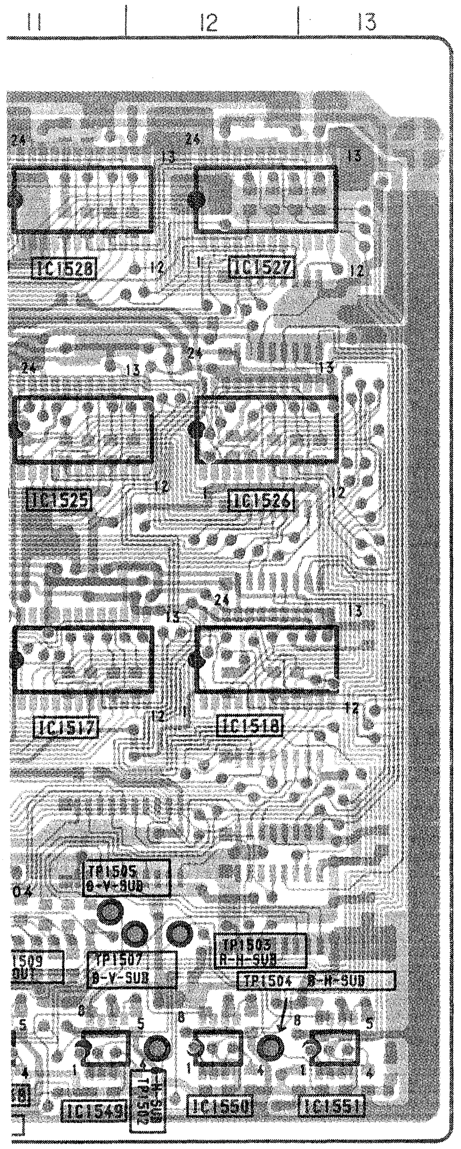

IDE -
2
3
4
5
6
7
8
9
10
11
12
13
346- 003-A
TP1501 GND
DB
SONY
CAD
IC1542
IC1546
IC1534
IC1533
IC1532
IC1531
IC1530
IC1529
IC1528
IC1527
IC1537
IC1541
IC1545
IC1519
IC1520
IC1521
IC1522
IC1523
IC1524
IC1525
IC1526
IC1540
IC1544
IC1511
IC1512
IC1513
IC1514
IC1515
IC1516
IC1517
IC1518
IC1539
IC1543
1-639-934-11
(1-704-206-11)
DIP
Q1502
Q1501
C1502
C1503
C1501
C1504
L1502
L1501
CN1501
TP1505 B-V-SUB
TP1509 G-V-OUT
TP1507 B-V-SUB
TP1503 R-H-SUB
TP1504 B-H-SUB
TP1510 B-V-OUT
TP1506 R-V-SUB
TP1502 G-H-SUB
IC1547
IC1548
IC1549
IC1550
IC1551

– DB BOARD –

–CONDUCTOR SIDE–

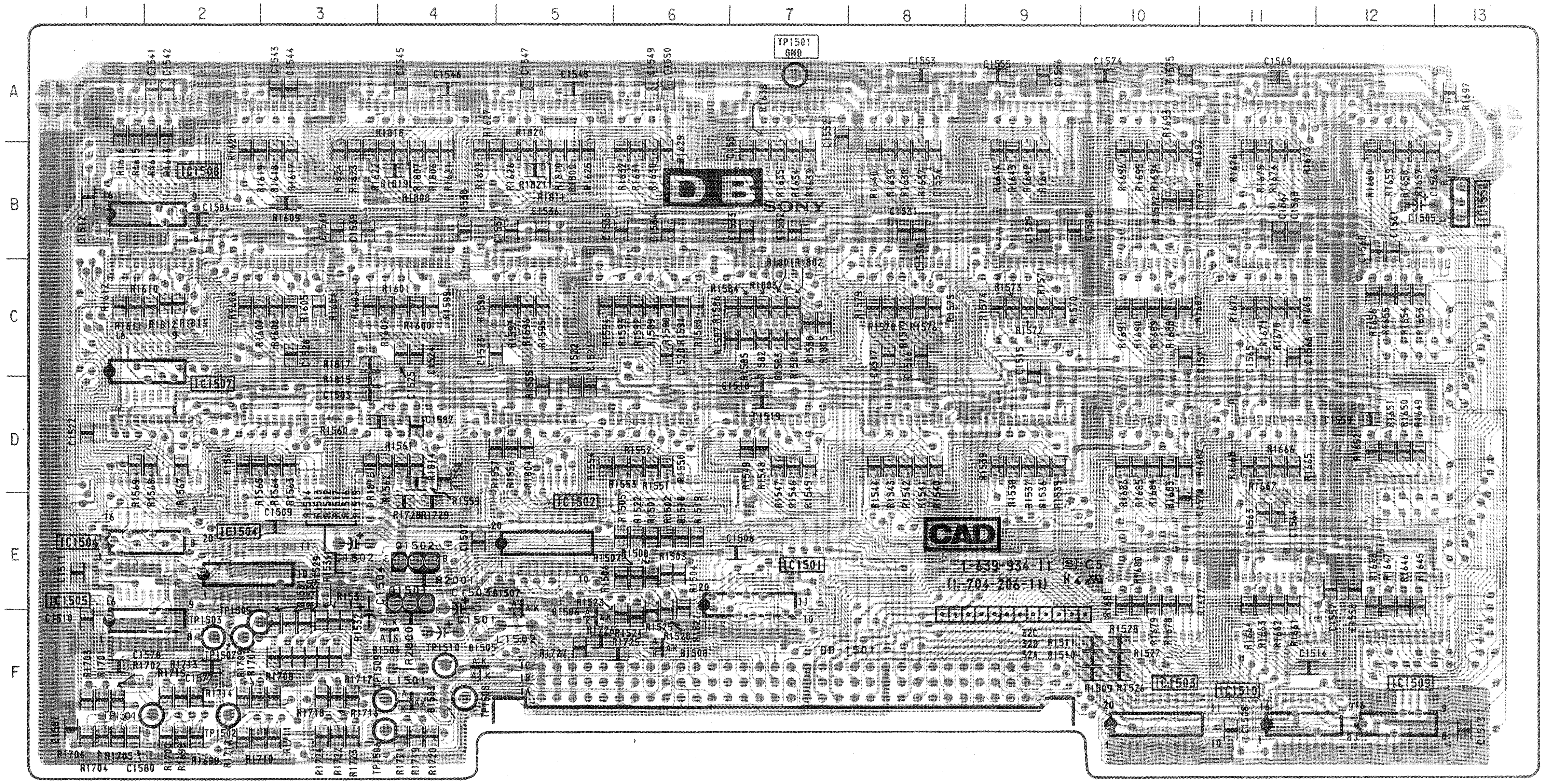

1
2
3
4
5
6
A
B
C
D
E
F
IC1508
IC1507
IC1506
IC1505
IC1504
IC1502
Q1502
Q1501
R2001
C1501
C1502
C1503
TP1502
TP1503
TP1504
TP1505
TP1506
TP1507
TP1508
TP1509
TP1510
L1501
L1502
D1504
D1505
D1506
D1507

[ELECTRONIC VR]


11
12
13
IC1528
IC1527
IC1525
IC1526
IC1517
IC1518
TP1505 B-V-SUB
TP1507 B-V-SUB
TP1503 R-H-SUB
TP1504 B-H-SUB
TP1509 OUT
TP1502 G-SUB
IC1549
IC1550
IC1551

– DB BOARD –

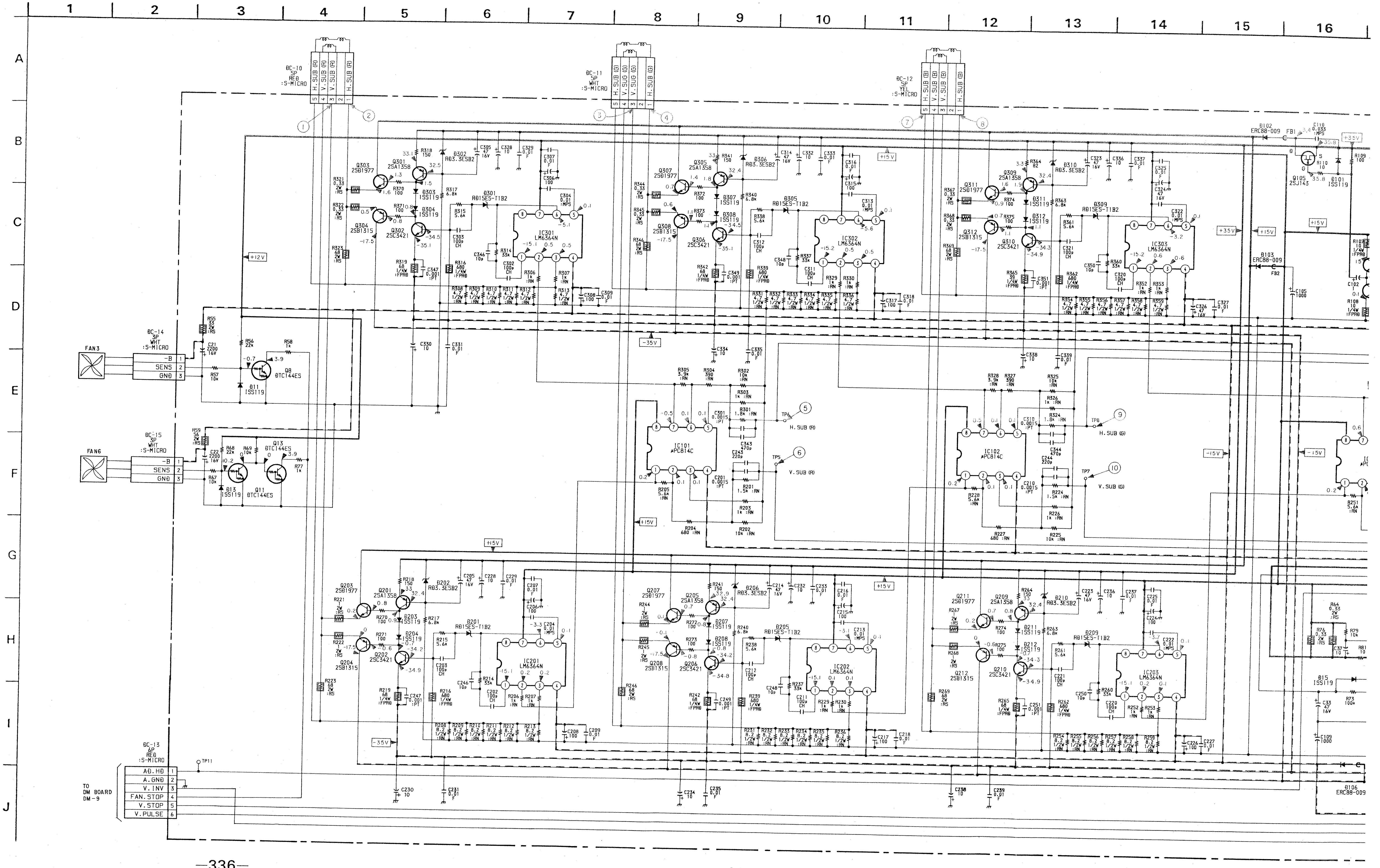
-CONDUCTOR SIDE-

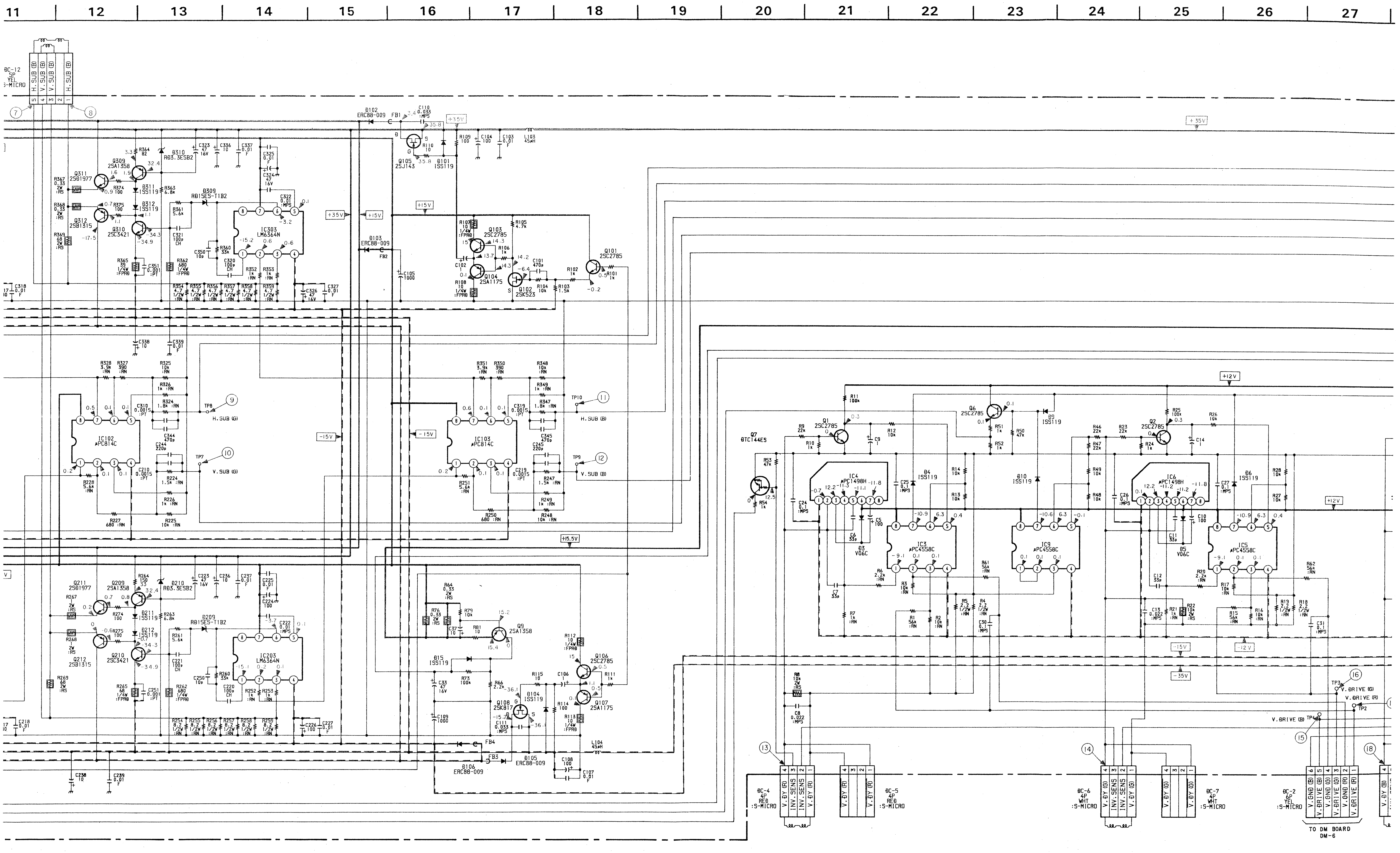

1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
TP1501 GND
DB
SONY
CAD
1-639-934-11
(1-704-206-11)
IC1501
IC1502
IC1503
IC1504
IC1505
IC1506
IC1507
IC1508
IC1509
IC1510
IC1552
Q1501
Q1502
L1501
L1502
TP1503
TP1504
TP1505
TP1506
TP1507
TP1508
TP1510
DB-1501

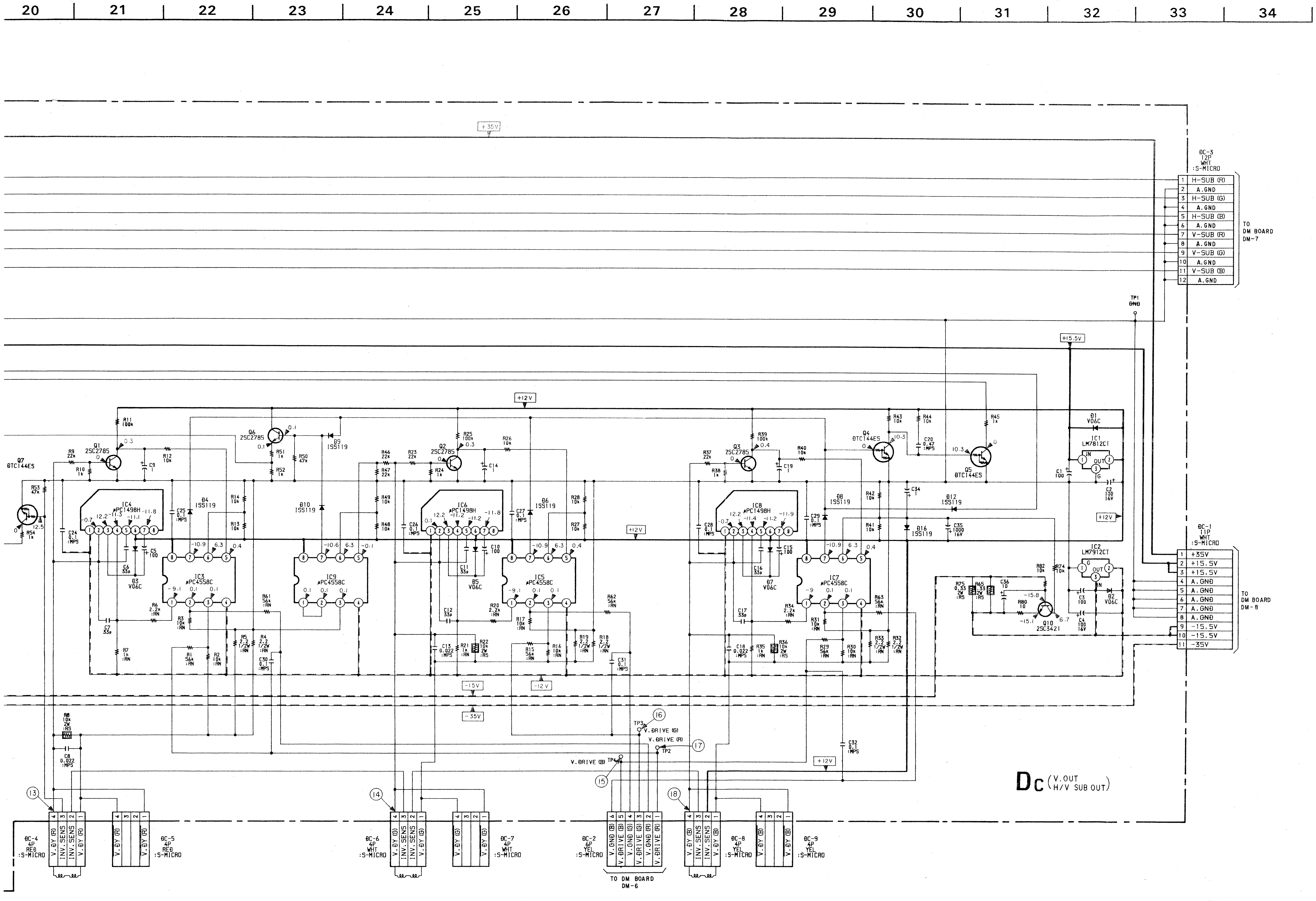
DB BOARD (CONDUCTOR SIDE)

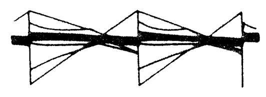
IC	
IC1501	E-7
IC1502	E-5
IC1503	F-10
IC1504	E-2
IC1505	F-1
IC1506	E-1
IC1507	C-2
IC1508	B-2
IC1509	F-12
IC1510	F-11
IC1552	B-13
TRANSISTOR	
Q1501	E-4
Q1502	E-4
DIODE	
D1503	F-4
D1504	F-4
D1505	F-4
D1506	F-5
D1507	E-5
D1508	F-6

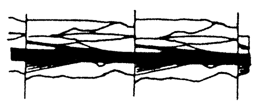
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.

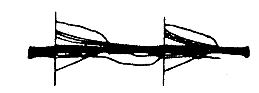

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
DC-10 5P RED :S-MICRO
H.SUB (R)
V.SUB (R)
V.SUB (R)
H.SUB (R)
DC-11 5P WHT :S-MICRO
H.SUB (G)
V.SUB (G)
V.SUG (G)
H.SUB (G)
DC-12 5P YEL :S-MICRO
H.SUB (B)
V.SUB (B)
V.SUB (B)
H.SUB (B)
IC301 LM6364N
IC302 LM6364N
IC303 LM6364N
IC101 μPC814C
IC102 μPC814C
IC201 LM6364N
IC202 LM6364N
IC203 LM6364N
Q301 2SA1358
Q302 2SC3421
Q303 2SD1977
Q304 2SB1315
Q305 2SA1358
Q306 2SC3421
Q307 2SD1977
Q308 2SB1315
Q309 2SA1358
Q310 2SC3421
Q311 2SD1977
Q312 2SB1315
Q201 2SA1358
Q202 2SC3421
Q203 2SD1977
Q204 2SB1315
Q205 2SA1358
Q206 2SC3421
Q207 2SD1977
Q208 2SB1315
Q209 2SA1358
Q210 2SC3421
Q211 2SD1977
Q212 2SB1315
Q105 2SJ143
D101 1SS119
D102 ERC88-009
D103 ERC88-009
D106 ERC88-009
FAN3
DC-14 3P WHT :S-MICRO
-B
SENS
GND
Q8 DTC144ES
D11 1SS119
FAN6
DC-15 3P WHT :S-MICRO
-B
SENS
GND
Q13 DTC144ES
Q11 DTC144ES
D13 1SS119
DC-13 6P RED :S-MICRO
TO DM BOARD DM-9
AD.HD
A.GND
V.INV
FAN.STOP
V.STOP
V.PULSE
TP11
+12V
-35V
+15V
+35V
-15V
TP4
TP5
TP6
TP7
TP8
H.SUB (R)
V.SUB (R)
H.SUB (G)
V.SUB (G)
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩


11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
BC-12 5P YEL :S-MICRO
H.SUB (B)
V.SUB (B)
V.SUB (G)
H.SUB (G)
D102 ERC88-009
FB1
C110 0.033 :MPS
+35V
Q105 2SJ143
D101 1SS119
R109 100
C104 100
C103 0.01 F
L103 45µH
Q309 2SA1358
Q311 2SD1977
Q312 2SB1315
Q310 2SC3421
D310 RD3.3ESB2
D311 1SS119
D312 1SS119
D309 RD15ES-T1B2
IC303 LM6364N
+15V
D103 ERC88-009
FB2
C105 1000
Q103 2SC2785
Q104 2SA1175
Q102 2SK523
Q101 2SC2785
IC102 µPC814C
IC103 µPC814C
TP8 H.SUB (G)
TP7 V.SUB (G)
TP10 H.SUB (B)
TP9 V.SUB (B)
-15V
+15.5V
Q209 2SA1358
Q211 2SD1977
Q212 2SB1315
Q210 2SC3421
D210 RD3.3ESB2
D211 1SS119
D212 1SS119
D209 RD15ES-T1B2
IC203 LM6364N
Q9 2SA1358
D15 1SS119
Q108 2SK817
D104 1SS119
Q106 2SC2785
Q107 2SA1175
L104 45µH
FB4
FB3
D105 ERC88-009
D106 ERC88-009
+12V
Q7 DTC144ES
Q1 2SC2785
Q6 2SC2785
D9 1SS119
Q2 2SC2785
IC4 µPC1498H
D4 1SS119
D10 1SS119
IC6 µPC1498H
D6 1SS119
IC3 µPC4558C
D3 V06C
IC9 µPC4558C
IC5 µPC4558C
D5 V06C
-15V
-12V
-35V
TP3 V.DRIVE (G)
V.DRIVE (R)
TP2
V.DRIVE (B) TP4
BC-4 4P RED :S-MICRO
V.DY (R) INV.SENS INV.SENS V.DY (R)
BC-5 4P RED :S-MICRO
V.DY (R) V.DY (R)
BC-6 4P WHT :S-MICRO
V.DY (G) INV.SENS INV.SENS V.DY (G)
BC-7 4P WHT :S-MICRO
V.DY (G) V.DY (G)
BC-2 6P YEL :S-MICRO
V.GND (B) V.DRIVE (B) V.GND (G) V.DRIVE (G) V.GND (R) V.DRIVE (R)
TO DM BOARD DM-6
V.DY (B)


20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
+35V
+12V
-15V
-12V
-35V
+15.5V
CC-3 12P WHT :S-MICRO
H-SUB (R)
A.GND
H-SUB (G)
H-SUB (B)
V-SUB (R)
V-SUB (G)
V-SUB (B)
TO DM BOARD DM-7
TP1 GND
CC-1 11P WHT :S-MICRO
+35V
+15.5V
-15.5V
-35V
TO DM BOARD DM-8
IC1 LM7812CT
IC2 LM7912CT
D1 V06C
D2 V06C
Q10 2SC3421
Q7 DTC144ES
Q1 2SC2785
Q6 2SC2785
Q2 2SC2785
Q3 2SC2785
Q4 DTC144ES
Q5 DTC144ES
IC4 μPC1498H
IC6 μPC1498H
IC8 μPC1498H
IC3 μPC4558C
IC9 μPC4558C
IC5 μPC4558C
IC7 μPC4558C
D3 V06C
D5 V06C
D7 V06C
D4 1SS119
D6 1SS119
D8 1SS119
D9 1SS119
D10 1SS119
D12 1SS119
D16 1SS119
TP3 V.DRIVE (G)
TP2 V.DRIVE (R)
TP4 V.DRIVE (B)
⑬
⑭
⑮
⑯
⑰
⑱
CC-4 4P RED :S-MICRO
CC-5 4P RED :S-MICRO
CC-6 4P WHT :S-MICRO
CC-7 4P WHT :S-MICRO
CC-2 6P YEL :S-MICRO
CC-8 4P YEL :S-MICRO
CC-9 4P YEL :S-MICRO
V.DY (R)
INV.SENS
V.DY (G)
V.DY (B)
V.GND (B)
V.DRIVE (B)
V.GND (G)
V.DRIVE (G)
V.GND (R)
V.DRIVE (R)
TO DM BOARD DM-6
Dc (V.OUT H/V SUB OUT)

①

30Vp-p (V)

②

25Vp-p (V)

③

25Vp-p (V)

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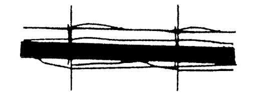
30Vp-p (V)

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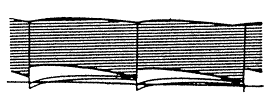
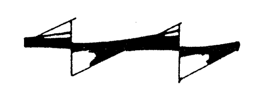
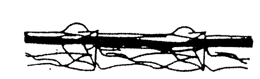
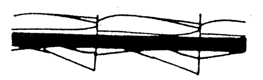
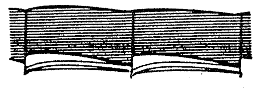
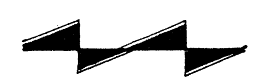

0.48Vp-p (V)

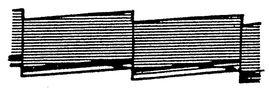
⑥

1.1Vp-p (V)

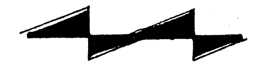
⑦

122Vp-p (V)

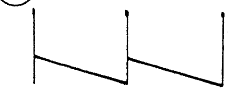
⑧

40Vp-p (V)

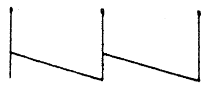
⑨

0.5Vp-p (V)

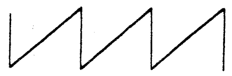
⑩

1Vp-p (V)

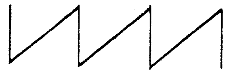
⑪

0.8Vp-p (V)

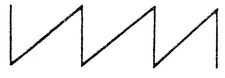
⑫

1Vp-p (V)

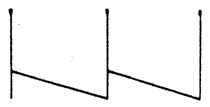
⑬

40Vp-p (V)

⑭

40Vp-p (V)

⑮

4Vp-p (V)

⑯

4Vp-p (V)

⑰

4Vp-p (V)

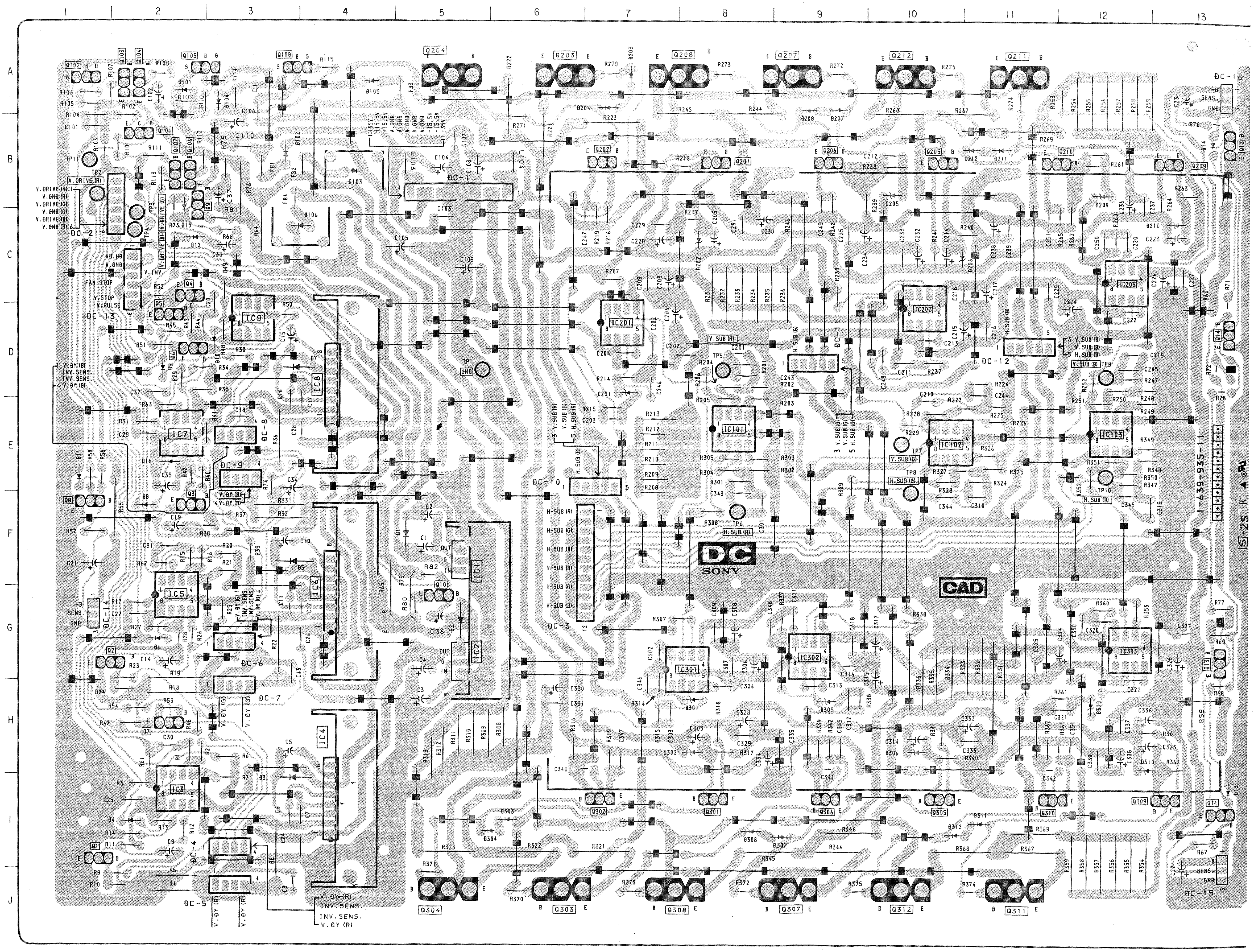
⑱

40Vp-p (V)

DC	IC1	LM7812CT	+12V REG	305	2SA1358	G-H SUB ACTIVE LOAD
	2	LM7912CT	–12V REG	306	2SC3421	G-H SUB DRIVE
	3	μPC4558C	R-V AMP	307	2SD1977	G-H SUB BUFF-1
	4	μPC1498H	R-V OUT	308	2SB1315	G-H SUB BUFF-2
	5	μPC4558C	G-V AMP	309	2SA1358	B-H SUB ACTIVE LOAD
	6	μPC1498H	G-V OUT	310	2SC3421	B-H SUB DRIVE
	7	μPC4558C	B-V AMP	311	2SD1977	B-H SUB BUFF-1
	8	μPC1498H	B-V OUT	312	2SB1315	B-H SUB BUFF-2
	9	μPC4558C	V.Pulse GEN			
	101	μPC814C	R-SUB AMP	D1	V06C	+12V REG PROT
	102	μPC814C	G-SUB AMP	2	V06C	–12V REG PROT
	103	μPC814C	B-SUB AMP	3	V06C	Pulse CHARGE-1
	201	LM6364N	R-V SUB PRE DRIVE	4	1SS119	GATE-1
	202	LM6364N	G-V SUB PRE DRIVE	5	V06C	Pulse CHARGE-2
	203	LM6364N	B-V SUB PRE DRIVE	6	1SS119	GATE-2
	301	LM6364N	R-H SUB PRE DRIVE	7	V06C	Pulse CHARGE-3
	302	LM6364N	G-H SUB PRE DRIVE	8	1SS119	GATE-3
	303	LM6364N	B-H SUB PRE DRIVE	9	1SS119	GATE-4
				10	1SS119	GATE-5
	Q1	2SC2785	V.Pulse DET-1	11	1SS119	PROT-1
	2	2SC2785	V.Pulse DET-2	12	1SS119	GATE-6
	3	2SC2785	V.Pulse DET-3	13	1SS119	PROT-2
	4	DTC144ES	V.STOP CONT SW-1	15	1SS119	DISCHARGE-1
	5	DTC144ES	V.STOP CONT SW-2	16	1SS119	DISCHARGE-2
	6	2SC2785	V.Pulse BUFF	101	1SS119	CLAMP-1
	7	DTC144ES	V.INV SW	102	ERC88-009	+P VOLT GATE-1
	8	DTC144ES	FAN STOP-1	103	ERC88-009	+P VOLT GATE-2
	9	2SA1358	+15V CORRENT PROT	104	1SS119	CLAMP-2
	10	2SC3421	–15V CORRENT PROT	105	ERC88-009	–P VOLT GATE-1
	11	DTC144ES	FAN STOP-2	106	ERC88-009	–P VOLT GATE-2
	13	DTC144ES	FAN STOP-3	201	RD15ES-B2	LEVEL SHIFT
	101	2SC2785	AD HD BUFF-1	202	RD3.3ES-B2	BIAS
	102	2SK523	AD HD SW	203	1SS119	R-V BIAS-1
	103	2SC2785	BUFF-1	204	1SS119	R-V BIAS-2
	104	2SA1175	BUFF-2	205	RD15ES-B2	LEVEL SHIFT
	105	2SJ143	+35V SW	206	RD3.3ES-B2	BIAS
	106	2SC2785	AD HD BUFF-2	207	1SS119	G-V BIAS-1
	107	2SA1175	AD HD BUFF-3	208	1SS119	G-V BIAS-2
	108	2SK817	–35V SW	209	RD15ES-B2	LEVEL SHIFT
	201	2SA1358	R-V SUB ACTIVE LOAD	210	RD3.3ES-B2	BIAS
	202	2SC3421	R-V SUB DRIVE	211	1SS119	B-V BIAS-1
	203	2SD1977	R-V SUB BUFF-1	212	1SS119	B-V BIAS-2
	204	2SB1315	R-V SUB BUFF-2	301	RD15ES-B2	LEVEL SHIFT
	205	2SA1358	G-V SUB ACTIVE LOAD	302	RD3.3ES-B2	BIAS
	206	2SC3421	G-V SUB DRIVE	303	1SS119	R-H BIAS-1
	207	2SD1977	G-V SUB BUFF-1	304	1SS119	R-H BIAS-2
	208	2SB1315	G-V SUB BUFF-2	305	RD15ES-B2	LEVEL SHIFT
	209	2SA1358	B-V SUB ACTIVE LOAD	306	RD3.3ES-B2	BIAS
	210	2SC3421	B-V SUB DRIVE	307	1SS119	G-H BIAS-1
	211	2SD1977	B-V SUB BUFF-1	308	1SS119	G-H BIAS-2
	212	2SB1315	B-V SUB BUFF-2	309	RD15ES-B2	LEVEL SHIFT
	301	2SA1358	R-H SUB ACTIVE LOAD	310	RD3.3ES-B2	BIAS
	302	2SC3421	R-H SUB DRIVE	311	1SS119	B-H BIAS-1
	303	2SD1977	R-H SUB BUFF-1	312	1SS119	B-H BIAS-2
	304	2SB1315	R-H SUB BUFF-2			

	G-H SUB ACTIVE LOAD
	G-H SUB DRIVE
	G-H SUB BUFF-1
	G-H SUB BUFF-2
	B-H SUB ACTIVE LOAD
	B-H SUB DRIVE
	B-H SUB BUFF-1
	B-H SUB BUFF-2
	+12V REG PROT
	–12V REG PROT
	Pulse CHARGE-1
	GATE-1
	Pulse CHARGE-2
	GATE-2
	Pulse CHARGE-3
	GATE-3
	GATE-4
	GATE-5
	PROT-1
	GATE-6
	PROT-2
	DISCHARGE-1
	DISCHARGE-2
	CLAMP-1
9	+P VOLT GATE-1
9	+P VOLT GATE-2
	CLAMP-2
9	–P VOLT GATE-1
9	–P VOLT GATE-2
2	LEVEL SHIFT
32	BIAS
	R-V BIAS-1
	R-V BIAS-2
2	LEVEL SHIFT
32	BIAS
	G-V BIAS-1
	G-V BIAS-2
2	LEVEL SHIFT
32	BIAS
	B-V BIAS-1
	B-V BIAS-2
2	LEVEL SHIFT
32	BIAS
	R-H BIAS-1
	R-H BIAS-2
2	LEVEL SHIFT
32	BIAS
	G-H BIAS-1
	G-H BIAS-2
2	LEVEL SHIFT
32	BIAS
	B-H BIAS-1
	B-H BIAS-2

– DC BOARD –

DC [V. OUT, H/V SUB OUT]


1
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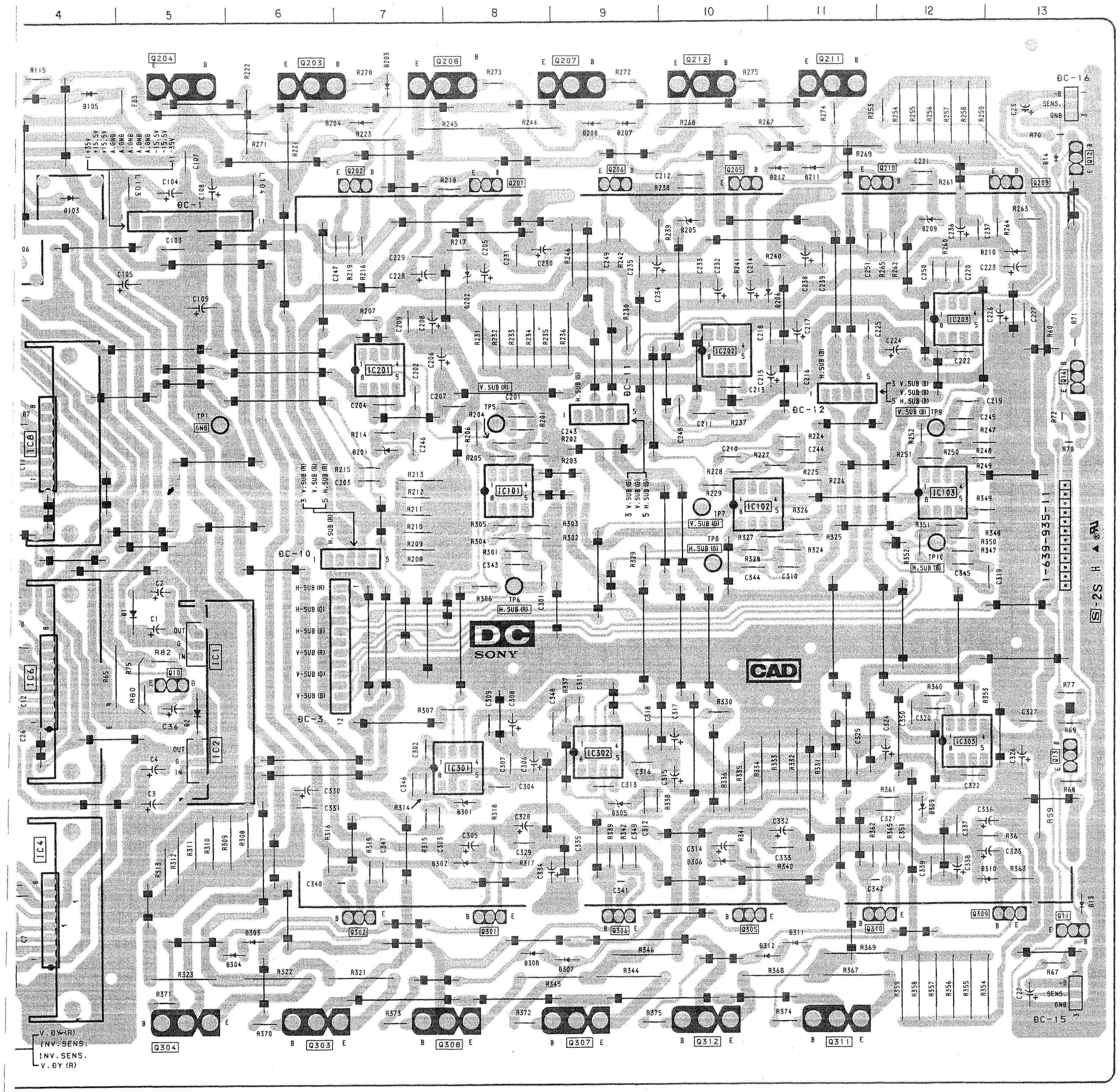
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
DC
SONY
CAD
1-639-935-11
CN-1
CN-2
CN-3
CN-4
CN-5
CN-6
CN-7
CN-8
CN-9
CN-10
CN-11
CN-12
CN-13
CN-14
CN-15
CN-16
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC101
IC102
IC103
IC201
IC202
IC203
IC301
IC302
IC303
Q204
Q203
Q208
Q207
Q212
Q211
Q304
Q303
Q308
Q307
Q312
Q311
TP1
TP2
TP5
TP6
TP7
TP8
TP9
TP10
TP11
V.DRIVE(R)
V.GND(R)
V.DRIVE(G)
V.GND(G)
V.DRIVE(B)
V.GND(B)
V.SUB(R)
V.SUB(G)
V.SUB(B)
H.SUB(R)
H.SUB(G)
H.SUB(B)
V.DY(R)
V.DY(G)
V.DY(B)
INV.SENS.
FAN.STOP
V.STOP
V.PULSE
V.INV
SENS.
GND

DC

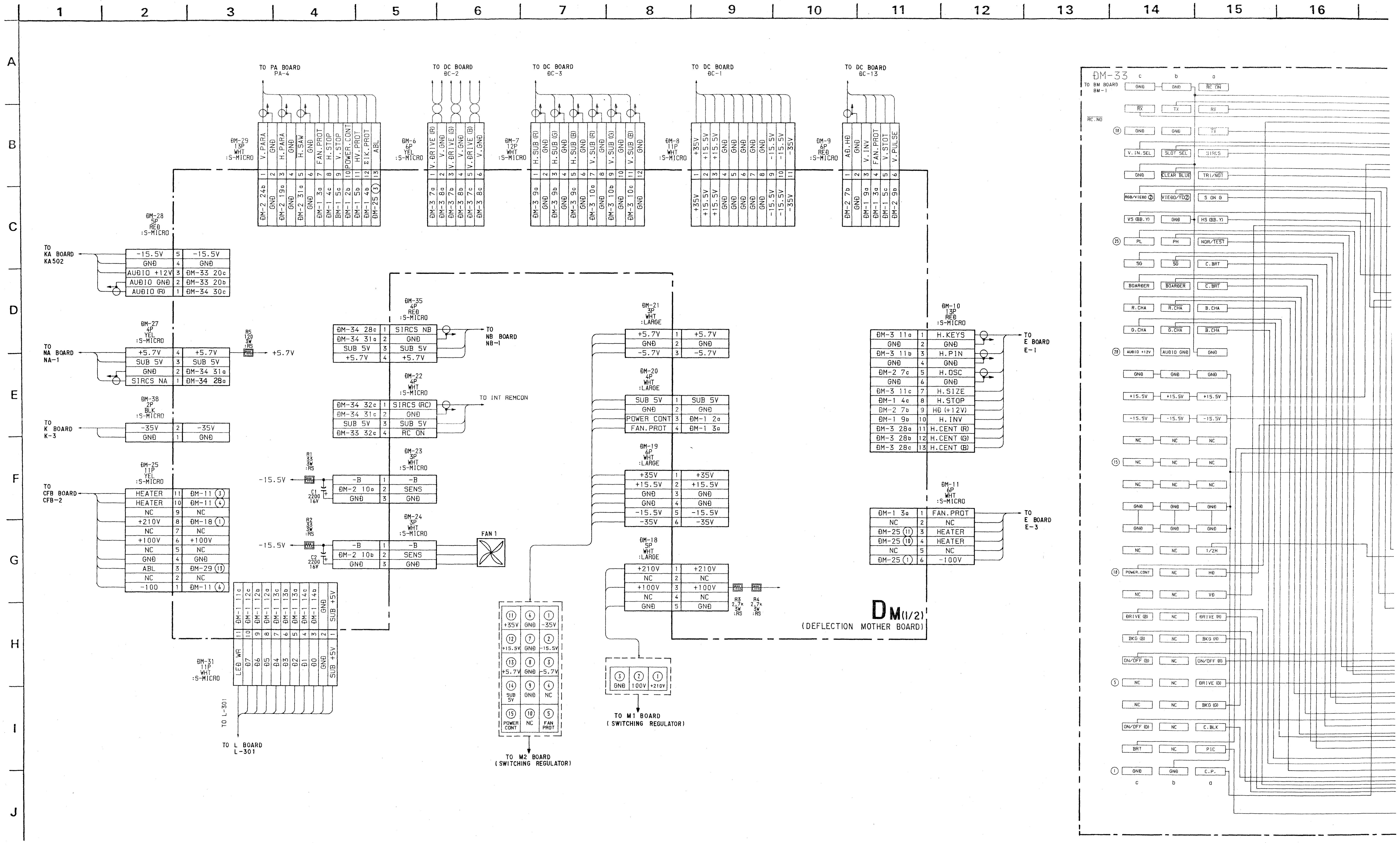
[V. OUT, H/V SUB OUT]

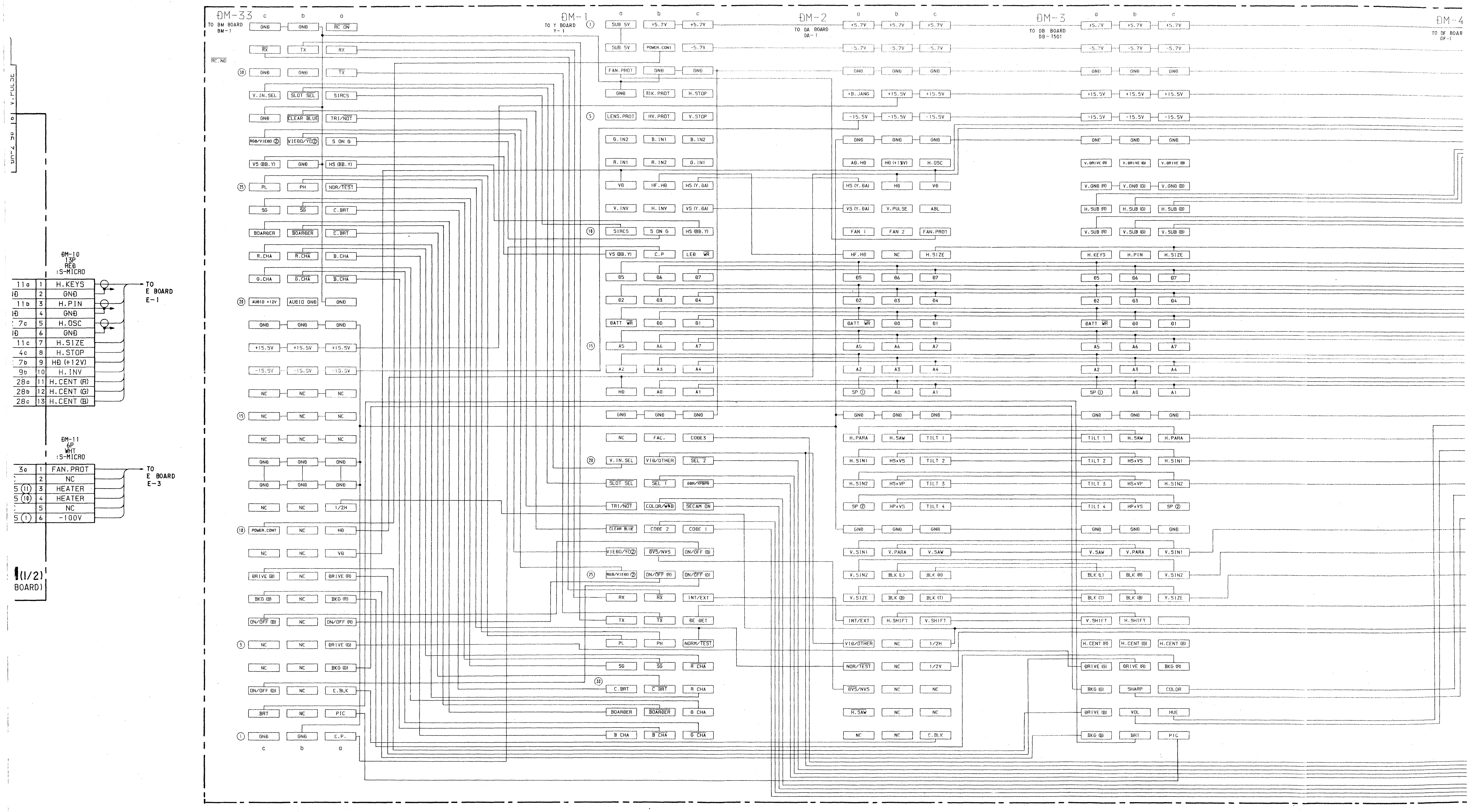

4
5
6
7
8
9
10
11
12
13
DC SONY
CAD
1-639-935-11
S-2S H
IC1
IC2
IC4
IC6
IC8
IC101
IC102
IC103
IC201
IC202
IC203
IC301
IC302
IC303
Q10
Q11
Q13
Q14
Q201
Q202
Q203
Q204
Q205
Q206
Q207
Q208
Q209
Q210
Q211
Q212
Q301
Q302
Q303
Q304
Q305
Q306
Q307
Q308
Q309
Q310
Q311
Q312
DC-1
DC-3
DC-10
DC-11
DC-12
DC-15
DC-16
TP1
TP5
TP6
TP7
TP8
TP9
TP10
GND
SENS.
V. SUB (R)
V. SUB (G)
V. SUB (B)
H. SUB (R)
H. SUB (G)
H. SUB (B)
V. DY (R)
INV. SENS.
INV. SENS.
V. DY (R)

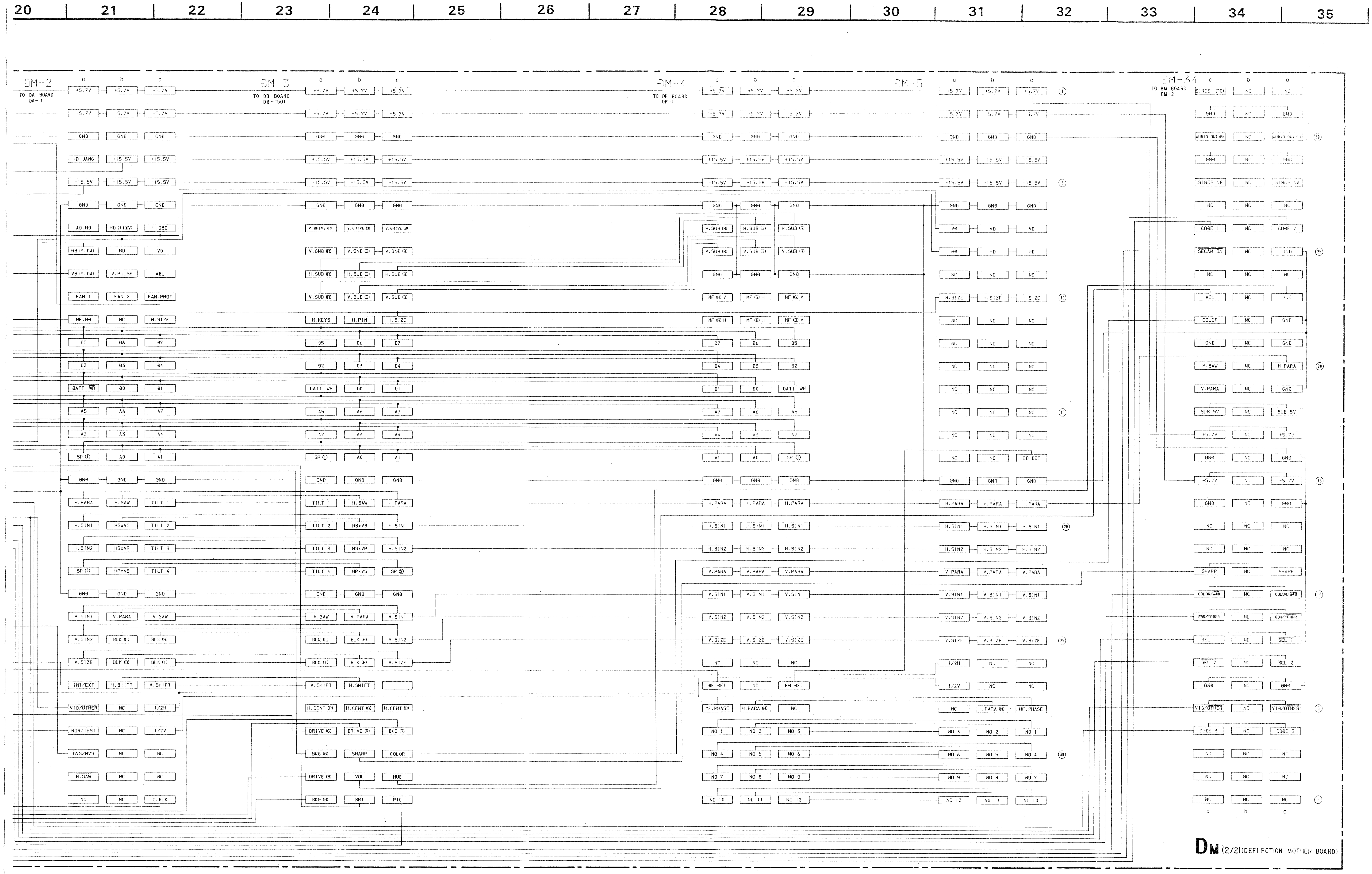
IC	
IC1	F-5
IC2	G-5
IC3	I-2
IC4	H-4
IC5	G-2
IC6	G-4
IC7	E-2
IC8	D-4
IC9	D-3
IC101	E-8
IC102	E-10
IC103	E-12
IC201	D-7
IC202	D-10
IC203	C-12
IC301	G-8
IC302	G-9
IC303	G-12

TRANSISTOR	
Q1	I-1
Q2	G-1
Q3	F-2
Q4	C-2
Q5	D-2
Q6	D-2
Q7	H-2
Q8	F-1
Q9	B-2
Q10	G-5
Q11	I-13
Q13	G-13
Q101	B-2
Q102	A-1
Q103	A-2
Q104	A-2
Q105	A-2
Q106	B-2
Q107	B-2
Q108	A-3
Q201	B-8
Q202	B-7
Q203	A-6
Q204	A-5
Q205	B-10
Q206	B-9
Q207	A-9
Q208	A-8
Q209	B-13
Q210	B-12
Q211	A-11
Q212	A-10
Q301	I-8
Q302	I-7
Q303	J-6
Q304	J-5
Q305	I-10
Q306	I-9
Q307	J-9
Q308	J-7
Q309	I-13
Q310	I-11
Q311	J-11
Q312	J-10

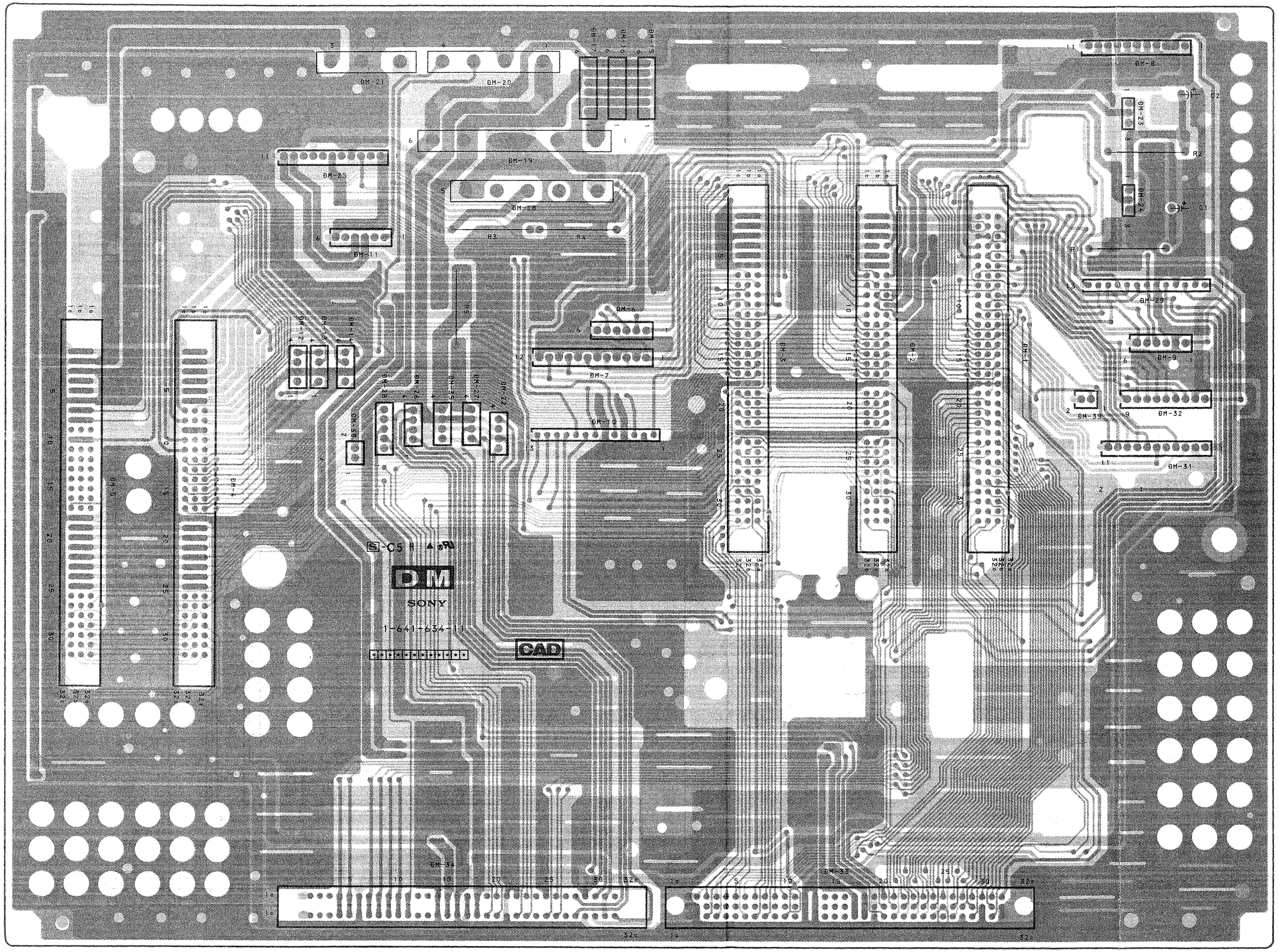
DIODE	
D1	F-5
D2	G-5
D3	I-3
D4	I-2
D5	F-3
D6	G-2
D7	D-3
D8	F-2
D9	D-2
D10	D-3
D11	E-1
D12	C-2
D13	I-13
D15	C-2
D16	E-2
D101	A-2
D102	B-3
D103	B-4
D104	A-3
D105	A-4
D106	C-4
D201	D-7
D202	C-8
D203	A-7
D204	A-7
D205	B-10
D206	C-11
D207	A-9
D208	A-9
D209	B-12
D210	C-13
D211	B-11
D212	B-11
D301	H-8
D302	H-8
D303	I-6
D304	I-5
D305	H-9
D306	H-10
D307	I-9
D308	I-8
D309	H-12
D310	H-12
D311	I-11
D312	I-10

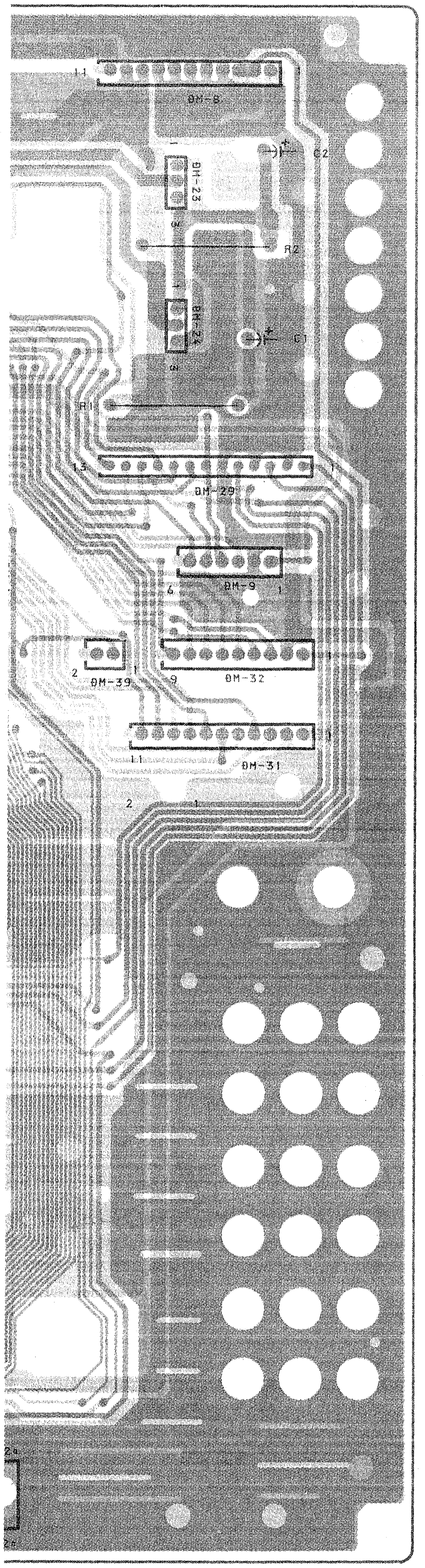

DM(1/2)
(DEFLECTION MOTHER BOARD)
TO PA BOARD PA-4
TO DC BOARD DC-2
TO DC BOARD DC-3
TO DC BOARD DC-1
TO DC BOARD DC-13
DM-29 13P WHT :S-MICRO
V.PARA
GND
H.PARA
GND
H.SAW
GND
FAN.PROT
H.STOP
V.STOP
POWER.CONT
HV.PROT
ΣIK.PROT
ABL
DM-6 6P YEL :S-MICRO
V.DRIVE (R)
V.GND
V.DRIVE (G)
V.GND
V.DRIVE (B)
V.GND
DM-7 12P WHT :S-MICRO
H.SUB (R)
H.SUB (G)
H.SUB (B)
V.SUB (R)
V.SUB (G)
V.SUB (B)
DM-8 11P WHT :S-MICRO
+35V
+15.5V
-15.5V
-35V
DM-9 6P RED :S-MICRO
AD.HD
V.INV
FAN.PROT
V.STOT
V.PULSE
DM-28 5P RED :S-MICRO
TO KA BOARD KA502
-15.5V
AUDIO +12V
AUDIO GND
AUDIO (R)
DM-33 20c
DM-33 20b
DM-34 30c
DM-27 4P YEL :S-MICRO
TO NA BOARD NA-1
+5.7V
SUB 5V
SIRCS NA
DM-34 31a
DM-34 28a
R5 120 5W :RS
DM-38 2P BLK :S-MICRO
TO K BOARD K-3
-35V
DM-25 11P YEL :S-MICRO
TO CFB BOARD CFB-2
HEATER
NC
+210V
+100V
ABL
-100
DM-11 ③
DM-11 ④
DM-18 ①
DM-29 ⑬
DM-11 ⑥
DM-35 4P RED :S-MICRO
SIRCS NB
TO NB BOARD NB-1
DM-22 4P WHT :S-MICRO
SIRCS (RC)
RC ON
TO INT REMCON
DM-23 3P WHT :S-MICRO
DM-24 3P WHT :S-MICRO
-B
SENS
R1 33 3W :RS
R2 33 3W :RS
C1 2200 16V
C2 2200 16V
-15.5V
FAN 1
DM-31 11P WHT :S-MICRO
LED WR
D7 D6 D5 D4 D3 D2 D1 D0
SUB +5V
TO L-301
TO L BOARD L-301
DM-21 3P WHT :LARGE
-5.7V
DM-20 4P WHT :LARGE
POWER CONT
FAN.PROT
DM-19 6P WHT :LARGE
DM-18 5P WHT :LARGE
R3 2.7k 3W :RS
R4 2.7k 3W :RS
TO M2 BOARD (SWITCHING REGULATOR)
TO M1 BOARD (SWITCHING REGULATOR)
DM-10 13P RED :S-MICRO
H.KEYS
H.PIN
H.OSC
H.SIZE
H.STOP
HD (+12V)
H.INV
H.CENT (R)
H.CENT (G)
H.CENT (B)
TO E BOARD E-1
DM-11 6P WHT :S-MICRO
TO E BOARD E-3
-100V
DM-33
TO BM BOARD BM-1
RC.NO
RC ON
RX
TX
V.IN.SEL
SLOT SEL
SIRCS
CLEAR BLUE
TRI/NOT
RGB/VIDEO ②
VIEDO/YC②
S ON G
VS (BB.Y)
HS (BB.Y)
PL
PH
NOR/TEST
SG
C.BRT
BOARDER
R.CHA
B.CHA
G.CHA
AUDIO +12V
AUDIO GND
+15.5V
-15.5V
1/2H
POWER.CONT
HD
VD
DRIVE (B)
DRIVE (R)
BKG (B)
BKG (R)
ON/OFF (B)
ON/OFF (R)
DRIVE (G)
BKG (G)
ON/OFF (G)
C.BLK
BRT
PIC
C.P.

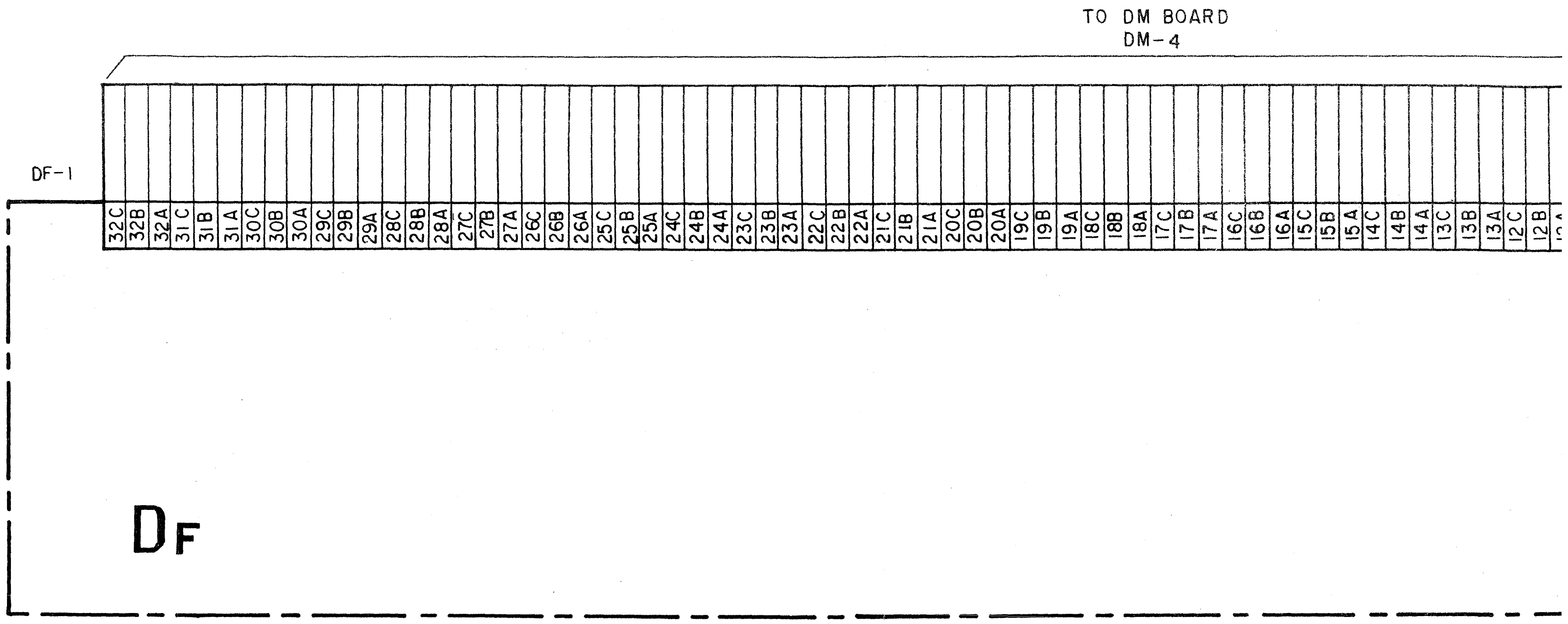

BM-33
TO BM BOARD BM-1
BM-1
TO Y BOARD Y-1
BM-2
TO DA BOARD DA-1
BM-3
TO DB BOARD DB-1501
BM-4
TO DF BOARD DF-1
BM-10 13P RED :S-MICRO
1 H.KEYS
2 GND
3 H.PIN
4 GND
5 H.OSC
6 GND
7 H.SIZE
8 H.STOP
9 HD (+12V)
10 H.INV
11 H.CENT (R)
12 H.CENT (G)
13 H.CENT (B)
TO E BOARD E-1
BM-11 6P WHT :S-MICRO
1 FAN.PROT
2 NC
3 HEATER
4 HEATER
5 NC
6 -100V
TO E BOARD E-3
(1/2) BOARD)
V.PULSE
c
b
a


20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
DM-2
TO DA BOARD DA-1
a b c
+5.7V +5.7V +5.7V
-5.7V -5.7V -5.7V
GND GND GND
+B.JANG +15.5V +15.5V
-15.5V -15.5V -15.5V
GND GND GND
AG.HD HD(+12V) H.OSC
HS(Y.OA) HD VD
VS(Y.OA) V.PULSE ABL
FAN 1 FAN 2 FAN.PROT
HF.HD NC H.SIZE
D5 D6 D7
D2 D3 D4
DATT WR D0 D1
A5 A6 A7
A2 A3 A4
SP① A0 A1
GND GND GND
H.PARA H.SAW TILT 1
H.SIN1 HSxVS TILT 2
H.SIN2 HSxVP TILT 3
SP② HPxVS TILT 4
GND GND GND
V.SIN1 V.PARA V.SAW
V.SIN2 BLK(L) BLK(R)
V.SIZE BLK(B) BLK(T)
INT/EXT H.SHIFT V.SHIFT
VID/OTHER NC 1/2H
NOR/TEST NC 1/2V
BVS/NVS NC NC
H.SAW NC NC
NC NC C.BLK
DM-3
TO DB BOARD DB-1501
a b c
+5.7V +5.7V +5.7V
-5.7V -5.7V -5.7V
GND GND GND
+15.5V +15.5V +15.5V
-15.5V -15.5V -15.5V
GND GND GND
V.DRIVE(R) V.DRIVE(G) V.DRIVE(B)
V.GND(R) V.GND(G) V.GND(B)
H.SUB(R) H.SUB(G) H.SUB(B)
V.SUB(R) V.SUB(G) V.SUB(B)
H.KEYS H.PIN H.SIZE
D5 D6 D7
D2 D3 D4
DATT WR D0 D1
A5 A6 A7
A2 A3 A4
SP① A0 A1
GND GND GND
TILT 1 H.SAW H.PARA
TILT 2 HSxVS H.SIN1
TILT 3 HSxVP H.SIN2
TILT 4 HPxVS SP②
GND GND GND
V.SAW V.PARA V.SIN1
BLK(L) BLK(R) V.SIN2
BLK(T) BLK(B) V.SIZE
V.SHIFT H.SHIFT
H.CENT(R) H.CENT(G) H.CENT(B)
DRIVE(G) DRIVE(R) BKG(R)
BKG(G) SHARP COLOR
DRIVE(B) VOL HUE
BKG(B) BRT PIC
DM-4
TO DF BOARD DF-1
a b c
+5.7V +5.7V +5.7V
-5.7V -5.7V -5.7V
GND GND GND
+15.5V +15.5V +15.5V
-15.5V -15.5V -15.5V
GND GND GND
H.SUB(B) H.SUB(G) H.SUB(R)
V.SUB(B) V.SUB(G) V.SUB(R)
GND GND GND
MF(R)V MF(G)H MF(G)V
MF(R)H MF(B)H MF(B)V
D7 D6 D5
D4 D3 D2
D1 D0 DATT WR
A7 A6 A5
A4 A3 A2
A1 A0 SP①
GND GND GND
H.PARA H.PARA H.PARA
H.SIN1 H.SIN1 H.SIN1
H.SIN2 H.SIN2 H.SIN2
V.PARA V.PARA V.PARA
V.SIN1 V.SIN1 V.SIN1
V.SIN2 V.SIN2 V.SIN2
V.SIZE V.SIZE V.SIZE
NC NC NC
GE DET NC EG DET
MF.PHASE H.PARA(M) NC
NO 1 NO 2 NO 3
NO 4 NO 5 NO 6
NO 7 NO 8 NO 9
NO 10 NO 11 NO 12
DM-5
a b c
+5.7V +5.7V +5.7V ①
-5.7V -5.7V -5.7V
GND GND GND
+15.5V +15.5V +15.5V
-15.5V -15.5V -15.5V ⑤
GND GND GND
VD VD VD
HD HD HD
NC NC NC
H.SIZE H.SIZE H.SIZE ⑩
NC NC NC
NC NC NC
NC NC NC
NC NC NC
NC NC NC ⑮
NC NC NC
NC NC EG DET
GND GND GND
H.PARA H.PARA H.PARA
H.SIN1 H.SIN1 H.SIN1 ⑳
H.SIN2 H.SIN2 H.SIN2
V.PARA V.PARA V.PARA
V.SIN1 V.SIN1 V.SIN1
V.SIN2 V.SIN2 V.SIN2
V.SIZE V.SIZE V.SIZE ㉕
1/2H NC NC
1/2V NC NC
NC H.PARA(M) MF.PHASE
NO 3 NO 2 NO 1
NO 6 NO 5 NO 4 ㉚
NO 9 NO 8 NO 7
NO 12 NO 11 NO 10
DM-34
TO BM BOARD BM-2
c b a
SIRCS(RC) NC NC
GND NC GND
AUDIO OUT(R) NC AUDIO OUT(L) ㉚
GND NC GND
SIRCS NB NC SIRCS NA
NC NC NC
CODE 1 NC CODE 2
SECAM ON NC GND ㉕
NC NC NC
VOL NC HUE
COLOR NC GND
GND NC GND
H.SAW NC H.PARA ⑳
V.PARA NC GND
SUB 5V NC SUB 5V
+5.7V NC +5.7V
GND NC GND
-5.7V NC -5.7V ⑮
GND NC GND
NC NC NC
NC NC NC
SHARP NC SHARP
COLOR/W/B NC COLOR/W/B ⑩
OBR/YPBPR NC OBR/YPBPR
SEL 1 NC SEL 1
SEL 2 NC SEL 2
GND NC GND
VID/OTHER NC VID/OTHER ⑤
CODE 3 NC CODE 3
NC NC NC
NC NC NC
NC NC NC ①
c b a
DM (2/2) (DEFLECTION MOTHER BOARD)

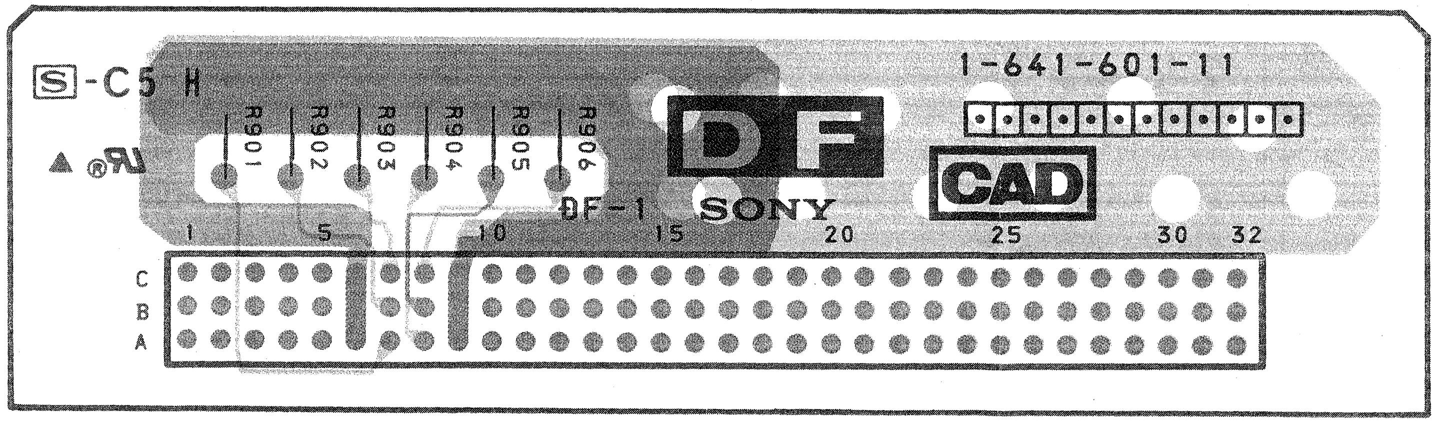
– DM BOARD – **DM** [DEFLECTION MOTHER BOARD]


DM-21
DM-20
DM-17
DM-16
DM-15
DM-8
C2
DM-23
R2
DM-25
DM-19
DM-18
DM-24
C1
R3
R4
DM-11
R1
DM-29
R5
DM-6
DM-7
DM-9
DM-12
DM-13
DM-14
DM-4
DM-3
DM-1
DM-39
DM-32
DM-28
DM-26
DM-35
DM-27
DM-22
DM-10
DM-38
DM-31
DM-5
DM-2
DM
SONY
1-641-634-11
CAD
DM-34
DM-33

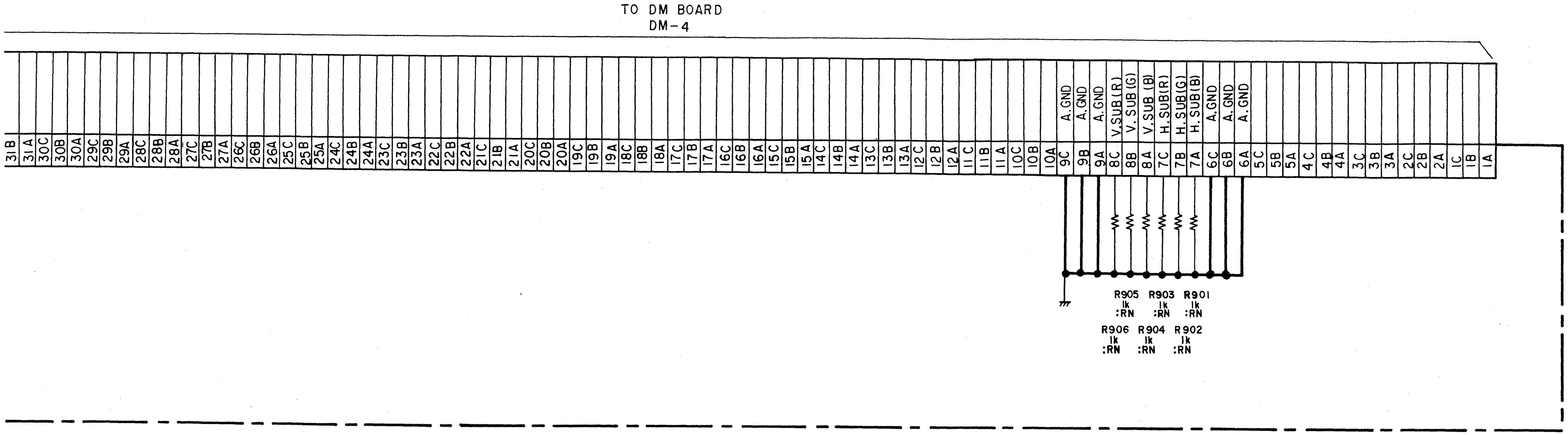

DM-8
DM-23
C2
R2
DM-24
C1
R1
DM-29
DM-9
DM-39
DM-32
DM-31

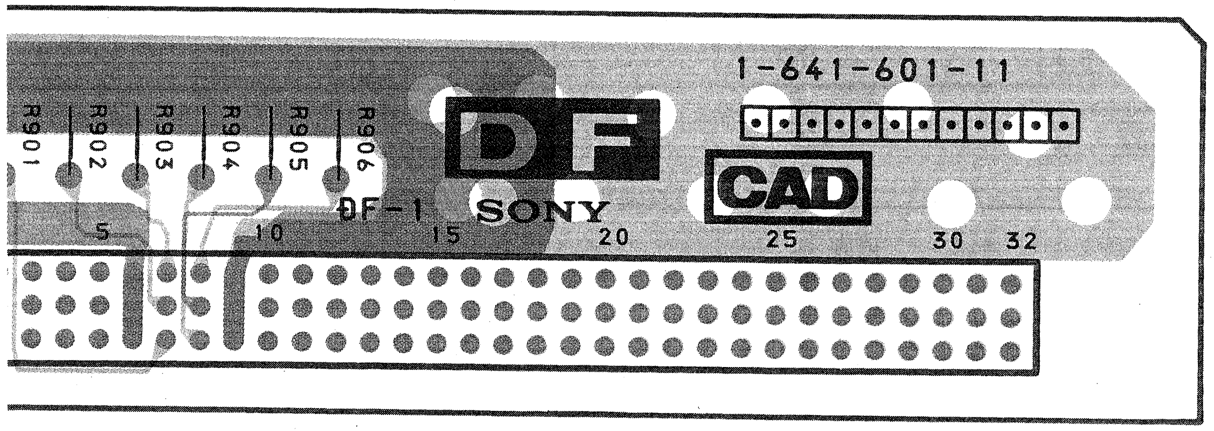

TO DM BOARD
DM-4
DF-1
DF

– DF BOARD –

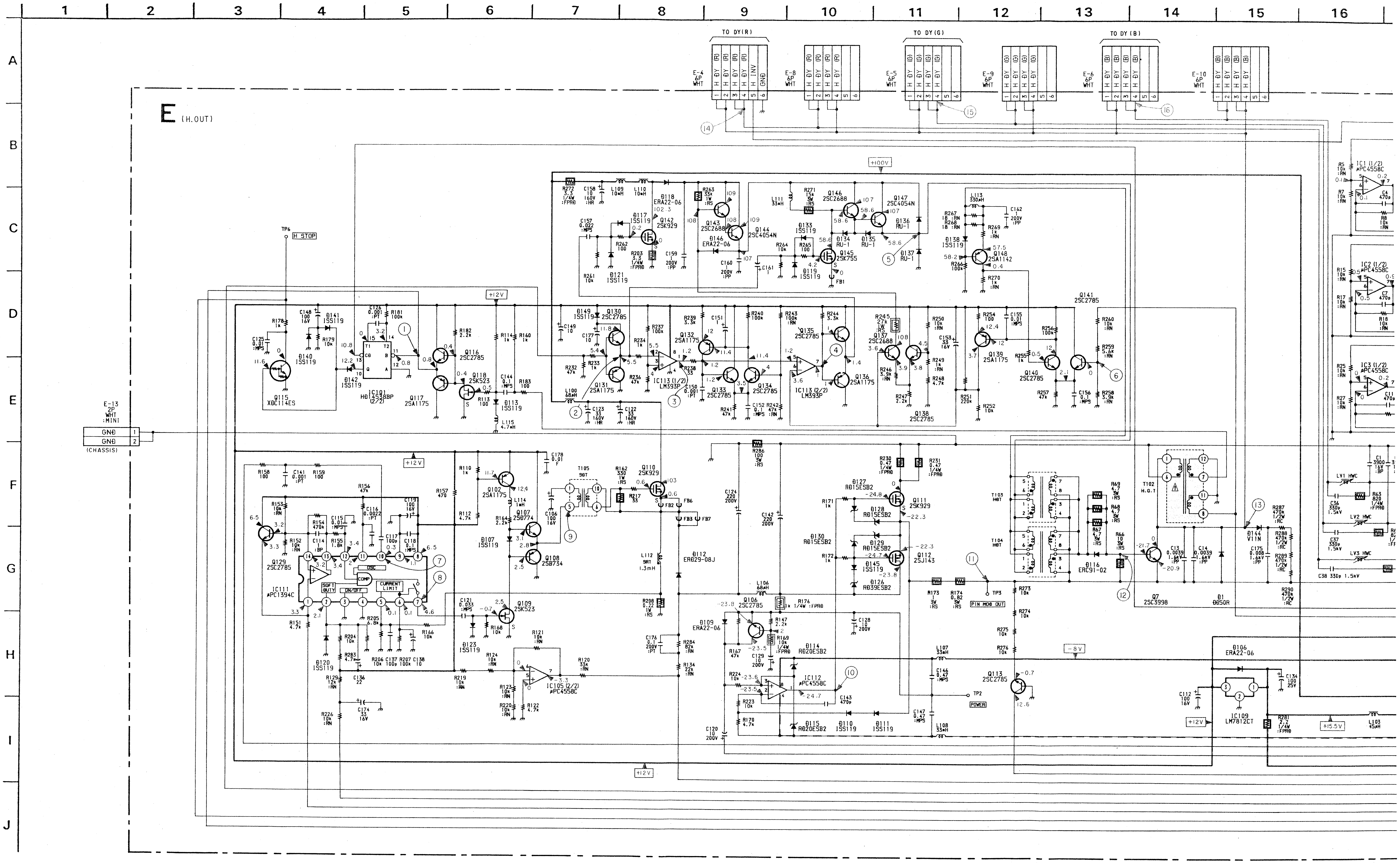

S-C5 H
R901
R902
R903
R904
R905
R906
DF
1-641-601-11
CAD
DF-1
SONY
1
5
10
15
20
25
30
32
C
B
A

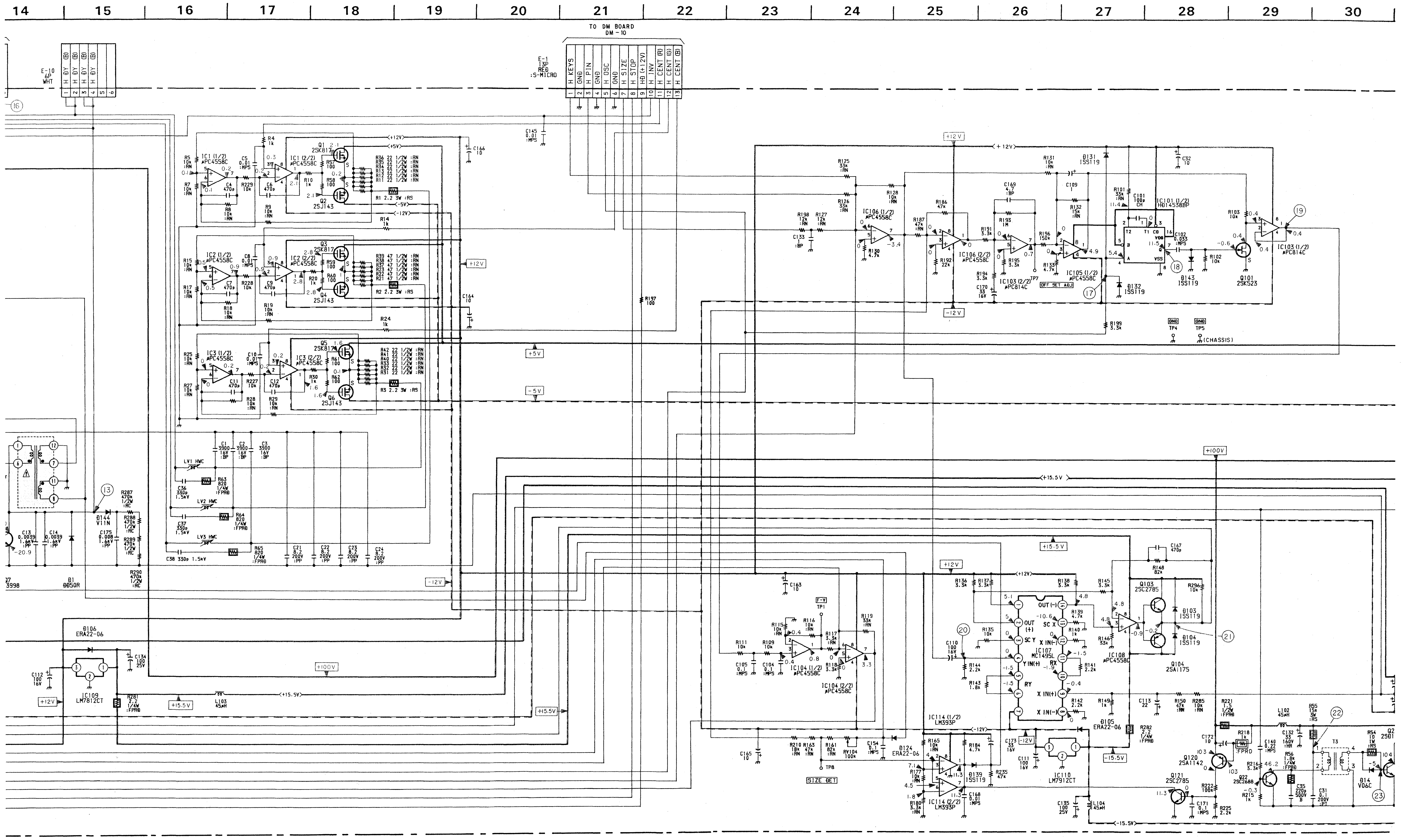
DF


TO DM BOARD
DM-4
A.GND
A.GND
A.GND
V.SUB(R)
V.SUB(G)
V.SUB(B)
H.SUB(R)
H.SUB(G)
H.SUB(B)
A.GND
A.GND
A.GND
31B 31A 30C 30B 30A 29C 29B 29A 28C 28B 28A 27C 27B 27A 26C 26B 26A 25C 25B 25A 24C 24B 24A 23C 23B 23A 22C 22B 22A 21C 21B 21A 20C 20B 20A 19C 19B 19A 18C 18B 18A 17C 17B 17A 16C 16B 16A 15C 15B 15A 14C 14B 14A 13C 13B 13A 12C 12B 12A 11C 11B 11A 10C 10B 10A 9C 9B 9A 8C 8B 8A 7C 7B 7A 6C 6B 6A 5C 5B 5A 4C 4B 4A 3C 3B 3A 2C 2B 2A 1C 1B 1A
R905 1k :RN
R903 1k :RN
R901 1k :RN
R906 1k :RN
R904 1k :RN
R902 1k :RN


1-641-601-11
R901
R902
R903
R904
R905
R906
DF
CAD
DF-1
SONY
5
10
15
20
25
30
32

- ▨ : Pattern from the side which enables seeing.
- ▓ : Pattern of the rear side.


E (H.OUT)
TO DY(R)
TO DY(G)
TO DY(B)
E-4 6P WHT
E-8 6P WHT
E-5 6P WHT
E-9 6P WHT
E-6 6P WHT
E-10 6P WHT
E-13 2P WHT :MINI
GND
GND
(CHASSIS)
TP6
H STOP
+100V
+12V
-8V
+15.5V
IC101 HD14538BP (2/2)
IC113 (1/2) LM393P
IC113 (2/2) LM393P
IC111 μPC1394C
IC105 (2/2) μPC4558C
IC112 μPC4558C
IC109 LM7812CT
IC1 (1/2) μPC4558C
IC2 (1/2) μPC4558C
IC3 (1/2) μPC4558C
T105 90T
T103 HDT
T104 HDT
T102 H.O.T
Q7 2SC3998
TP3
PIN HOB OUT
TP2
POWER
SOFT START
ON/OFF
CURRENT LIMIT
OSC
COMP


14
15
16
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18
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23
24
25
26
27
28
29
30
E-10 6P WHT
H DY (B)
TO DM BOARD DM-10
E-1 13P RED :S-MICRO
H KEYS
GND
H PIN
GND
H OSC
GND
H SIZE
H STOP
HD (+12V)
H INV
H CENT (R)
H CENT (G)
H CENT (B)
IC1 (1/2) μPC4558C
IC1 (2/2) μPC4558C
IC2 (1/2) μPC4558C
IC2 (2/2) μPC4558C
IC3 (1/2) μPC4558C
IC3 (2/2) μPC4558C
Q1 2SK817
Q2 2SJ143
Q3 2SK817
Q4 2SJ143
Q5 2SK817
Q6 2SJ143
R1 2.2 3W :RS
R2 2.2 3W :RS
R3 2.2 3W :RS
LV1 HWC
LV2 HWC
LV3 HWC
C38 330p 1.5kV
+12V
+5V
-5V
-12V
+100V
+15.5V
-15.5V
D144 V11N
D106 ERA22-06
IC109 LM7812CT
L103 45μH
IC106 (1/2) μPC4558C
IC106 (2/2) μPC4558C
IC103 (2/2) μPC814C
IC105 (1/2) μPC4558C
IC101 (1/2) HD14538BP
IC103 (1/2) μPC814C
Q101 2SK523
D131 1SS119
D132 1SS119
D143 1SS119
TP4
TP5
(CHASSIS)
TP7
OFF SET ADJ
IC104 (1/2) μPC4558C
IC104 (2/2) μPC4558C
F-V TP1
TP8
SIZE DET
IC107 MC1495L
IC108 μPC4558C
IC114 (1/2) LM393P
IC114 (2/2) LM393P
IC110 LM7912CT
D124 ERA22-06
D105 ERA22-06
D139 1SS119
L104 45μH
Q103 2SC2785
Q104 2SA1175
D103 1SS119
D104 1SS119
Q120 2SA1142
Q121 2SC2785
Q22 2SC2688
L102 45μH
T3
D14 V06C
⑬
⑯
⑰
⑱
⑲
⑳
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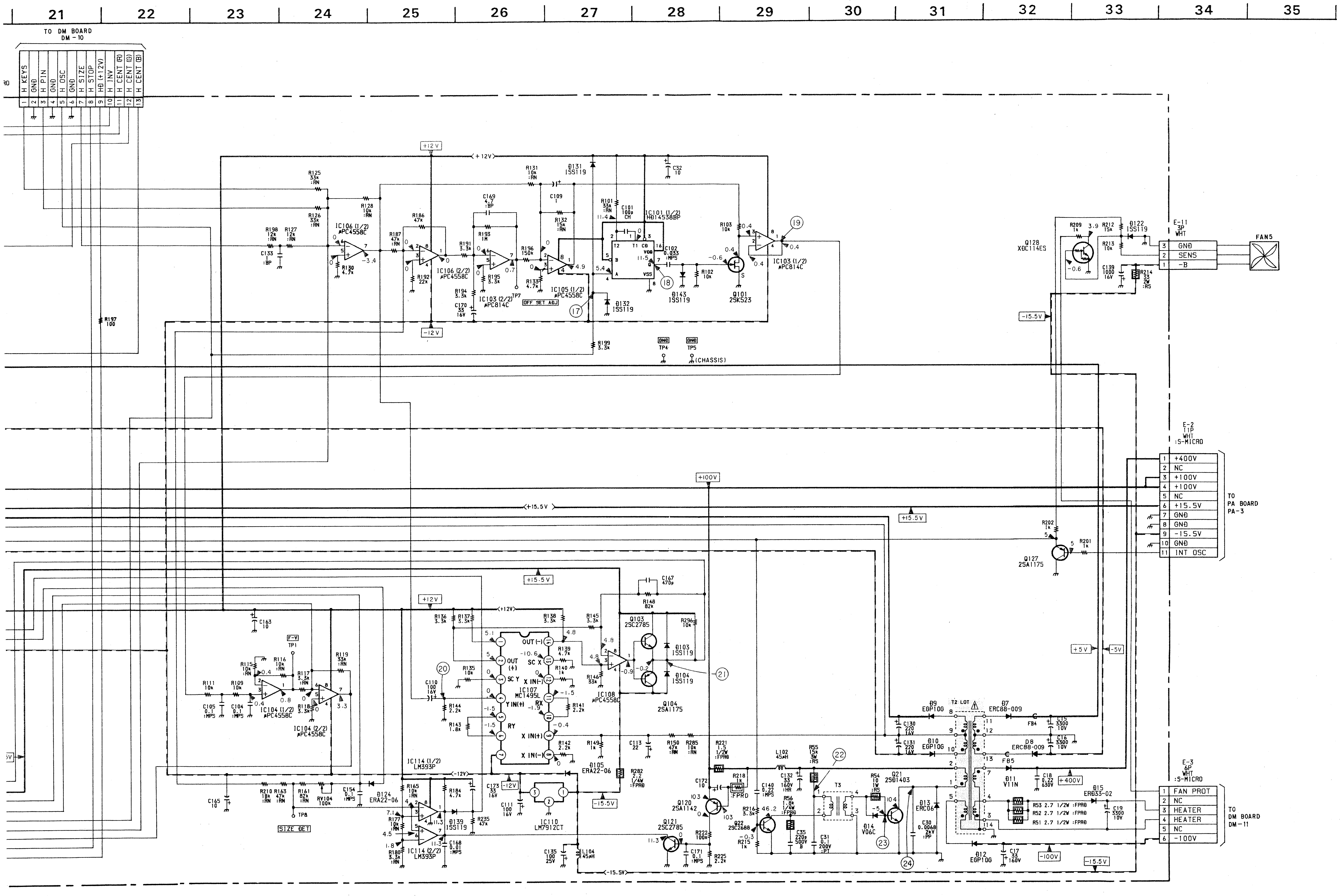
㉓
01
D050R
3998


21
22
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31
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34
35
TO DM BOARD DM-10
H KEYS
GND
H PIN
GND
H OSC
GND
H SIZE
H STOP
HD (+12V)
H INV
H CENT (R)
H CENT (G)
H CENT (B)
+12V
-12V
IC106 (1/2) μPC4558C
IC106 (2/2) μPC4558C
IC103 (2/2) μPC814C
IC105 (1/2) μPC4558C
IC101 (1/2) HD14538BP
IC103 (1/2) μPC814C
Q101 2SK523
D131 1SS119
D132 1SS119
D143 1SS119
OFF SET ADJ
TP4
TP5
(CHASSIS)
TP7
R197 100
R199 3.3k
FAN5
E-11 3P WHT
GND
SENS
-B
Q128 XOC114ES
D122 1SS119
R214 33 2W :RS
C139 1000 16V
-15.5V
E-2 11P WHT :S-MICRO
+400V
NC
+100V
+100V
NC
+15.5V
GND
GND
-15.5V
GND
INT OSC
TO PA BOARD PA-3
Q127 2SA1175
+100V
+15.5V
F-V
TP1
IC104 (1/2) μPC4558C
IC104 (2/2) μPC4558C
SIZE DET
TP8
D124 ERA22-06
IC114 (1/2) LM393P
IC114 (2/2) LM393P
D139 1SS119
IC107 MC1495L
IC110 LM7912CT
IC108 μPC4558C
Q103 2SC2785
Q104 2SA1175
D103 1SS119
D104 1SS119
D105 ERA22-06
OUT (-)
OUT (+)
SC X
SC Y
X IN(-)
Y IN(+)
RX
RY
X IN(+)
L104 45μH
L102 45μH
Q120 2SA1142
Q121 2SC2785
Q122 2SC2688
T3
Q21 2SD1403
D14 V06C
D13 ERC06
T2 LOT
D9 EGP10G
D7 ERC88-009
D10 EGP10G
D8 ERC88-009
D11 V11N
D12 EGP10G
D15 ERD33-02
F84
F85
+5V
-5V
-100V
+400V
E-3 6P WHT :S-MICRO
FAN PROT
NC
HEATER
HEATER
NC
-100V
TO DM BOARD DM-11
R53 2.7 1/2W :FPRD
R52 2.7 1/2W :FPRD
R51 2.7 1/2W :FPRD
17
18
19
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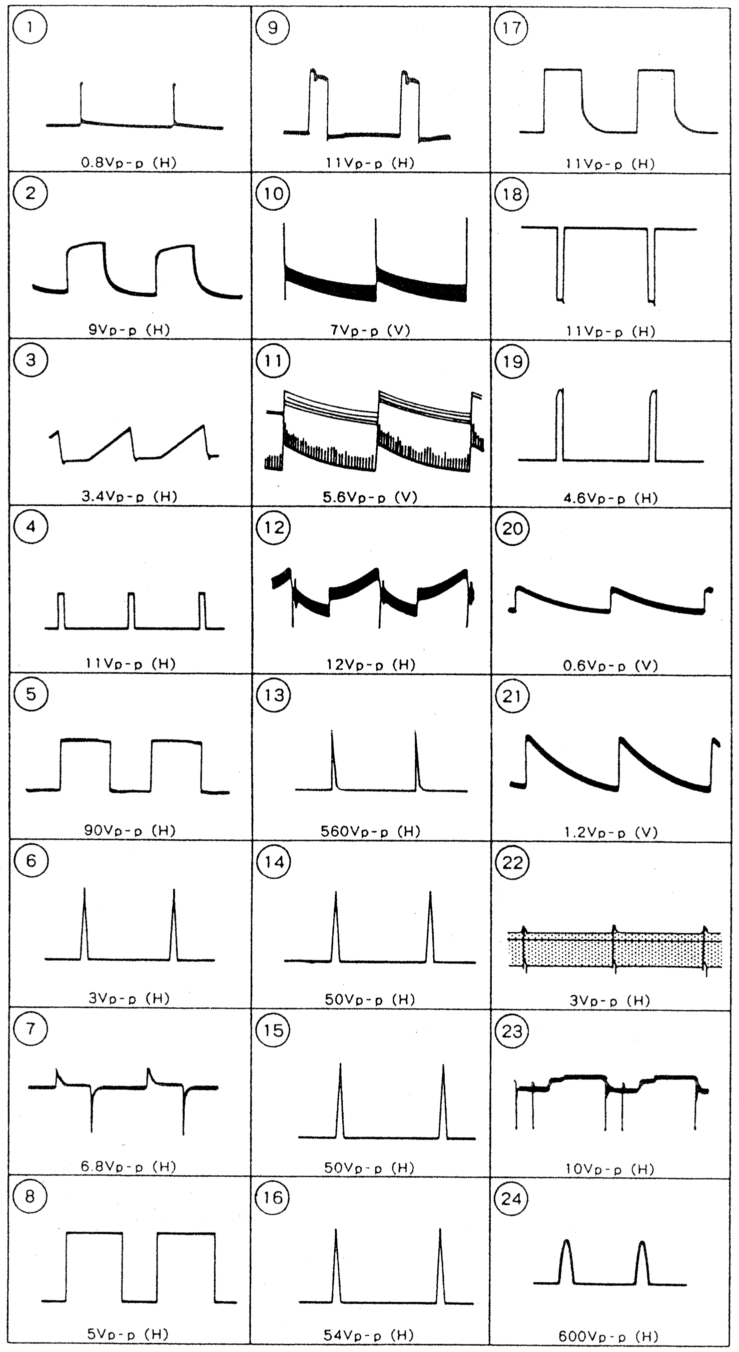
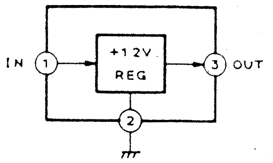
23
24

REF.	Pin No.	PAL
IC301	⑦	1.3
IC501	①	4.9
IC112	①	− 24.7
	②	− 23.5
	③	− 23.5
IC114	②	4.7
	⑤	4.7

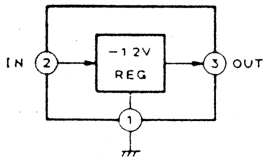
REF.		WHITE
Q007	B	− 21.6
	C	− 0.3
	E	− 20.8
Q106	B	− 23.6
	C	− 23.6
	E	− 23.5
Q107	B	3.0
	C	–
	E	2.8
Q108	B	2.5
	C	–
	E	2.8
Q113	B	–
	C	12.7
	E	–
Q137	B	3.8
	C	106.3
	E	3
Q138	B	11.9
	C	3.5
	E	–
Q140	B	11.9
	C	3.5
	E	–
Q143	B	–
	C	11.9
	E	–
Q144	B	112
	C	112.5
	E	111.5
Q146	B	111.4
	C	112.3
	E	110.7
Q147	B	63.5
	C	110.3
	E	63.5
Q148	B	62.5
	C	0.4
	E	60.4



IC109 μPC7812



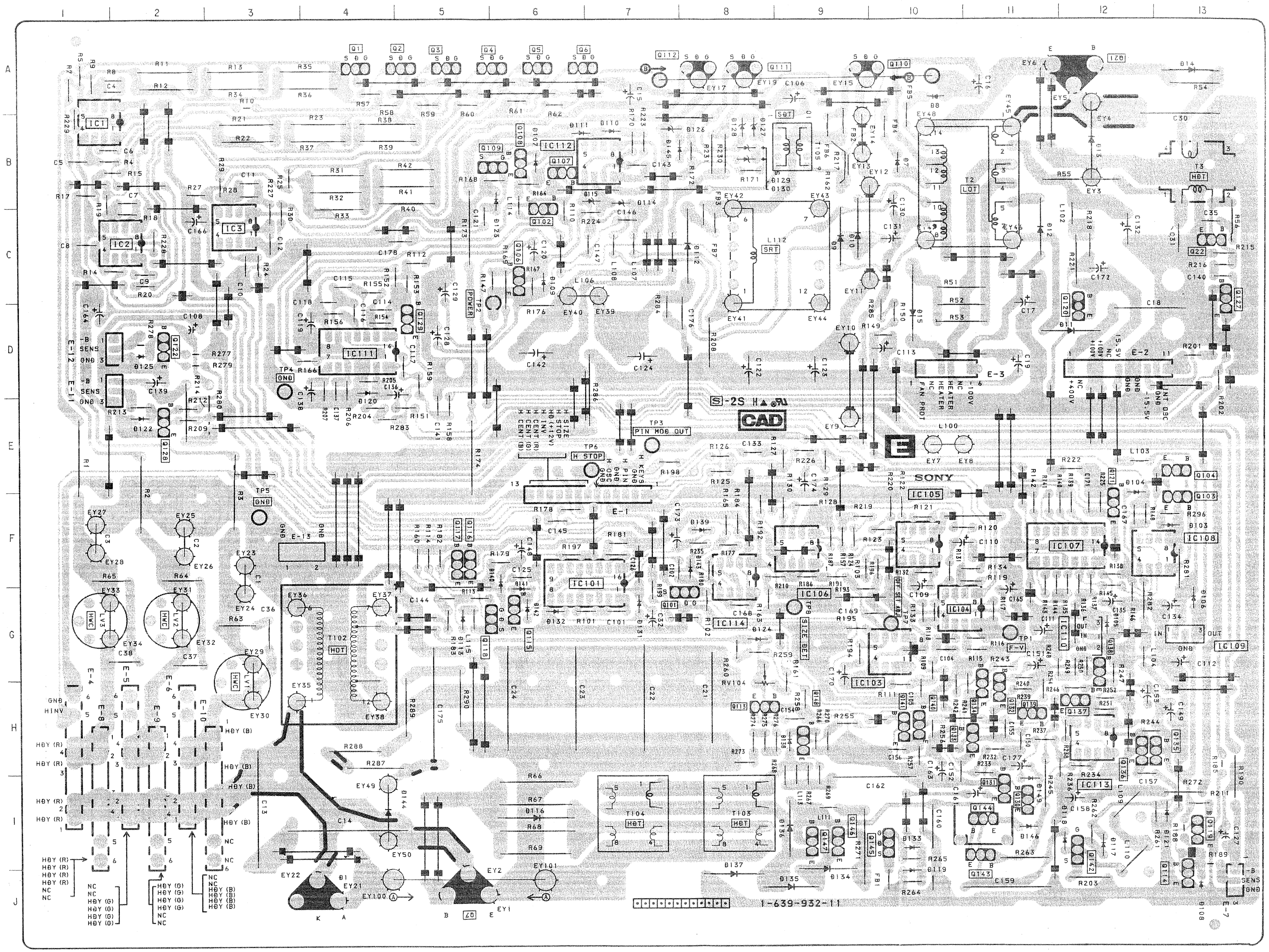
IC110 μPC7912



E	IC1	UPC4558C	H CENT DRIVE (R)	Q143	2SC2688	H DRIVE REG
	2	UPC4558C	H CENT DRIVE (G)	144	2SC4054	H DRIVE REG
	3	UPC4558C	H CENT DRIVE (B)	145	2SK755N	H DRIVE
	101	HD14538BP	H PULSE GEN.	146	2SC2688	H DRIVE BUFF
	103	UPC814C	F-V AMP	147	2SC4054N	H DRIVE BUFF
	104	UPC4558C	F-V AMP	148	2SA1142	1B DET
	105	UPC4558C	F-V AMP			
	106	UPC4558C	F-V AMP	D1	DD50R	H OUT DAMP
	107	MC1495L	MOD LEVEL CONT	7	ERC88-009	-5V RECT
	108	UPC4558C	PIN MOD PRE AMP	8	ERC88-009	+5V RECT
	109	LM7812CT	+12V REG.	9	EGP10G	PIN MOD RECT
	110	LM7912CT	-12V REG.	10	EGP10G	PIN MOD RECT
	111	UPC1394C	PIN MOD REG. CONT	11	V11N	+400V RECT
	112	UPC4558C	PIN MOD AMP	12	EGP10G	-100V RECT
	113	LM393P	H OSC DET	13	ERC06-15	LOT DAMP
	114	LM393P	H SIZE PROT	14	V06C	SPEED UP
				15	ERD33-02	HEATER RECT
	Q1	2SK817	H CENT OUT (R)	103	1SS119	PROT
	2	2SJ143	H CENT OUT (R)	104	1SS119	PROT
	3	2SK817	H CENT OUT (G)	105	ERA22-06	-12V REG. PROT
	4	2SJ143	H CENT OUT (G)	106	ERA22-06	+12V REG. PROT
	5	2SK817	H CENT OUT (B)	107	1SS119	PIN MOD REG. BIAS
	6	2SJ143	H CENT OUT (B)	109	ERA22-06	CLAMP
	7	2SC3998	H OUT	110	1SS119	LEVEL SHIFT
	21	2SD1403	LOT CONV.	111	1SS119	LEVEL SHIFT
	22	2SC2688	LOT DRIVE	112	ERD29-08J	PIN MOD REG. CLAMP
	101	2SK523	F-V SW	113	1SS119	CLAMP
	102	2SA1175	POWER OFF PROT	114	RD20ES-B2	PROT
	103	2SC2785	PIN MOD PRE BUFF	115	RD20ES-B2	PROT
	104	2SA1175	PIN MOD PRE BUFF	116	ERC91-02	SPEED UP
	106	2SC2785	PIN MOD PROT	117	1SS119	SPEED UP
	107	2SD774	PIN MOD REG. DRIVE	118	ERA22-06	CLAMP
	108	2SB734	PIN MOD REG. DRIVE	119	1SS119	PROT
	109	2SK523	PIN MOD REG. PRE DRIVE	120	1SS119	PROT
	110	2SK929	PIN MOD REG.	121	1SS119	PROT
	111	2SK929	H PIN OUT	122	1SS119	PROT
	112	2SJ143	H PIN OUT	123	1SS119	CLAMP
	113	2SC2785	H SIZE CONST	124	ERA22-06	H SIZE DET
	115	XDC114ES	H STOP SW	126	RD39ES-B2	PIN MOD DET
	116	2SC2785	HD OUT	127	RD15ES-B2	PROT
	117	2SA1175	HD OUT	128	RD15ES-B2	PROT
	118	2SK523	HD DRIVE	129	RD15ES-B2	PROT
	120	2SA1142	CURRENT PROT	130	RD15ES-B2	PROT
	121	2SC2785	CURRENT PROT SW	131	1SS119	PROT
	127	2SA1175	INV OSC BUFF	132	1SS119	PROT
	128	XDC114ES	FAN PROT SW	133	1SS119	SPEED UP
	129	2SC2785	POWER ON BIAS	134	RU-1	H DRIVE PROT
	130	2SC2785	H OSC BUFF	135	RU-1	H DRIVE PROT
	131	2SA1175	H OSC BUFF	136	RU-1	H DRIVE PROT
	132	2SA1175	CONST AMP	137	RU-1	H DRIVE PROT
	133	2SC2785	CONST AMP	138	1SS119	THERM CANCEL
	134	2SC2785	CONST AMP	139	1SS119	H SIZE PROT SW
	135	2SC2785	VARIABLE REG OUT	140	1SS119	DISCHARGE
	136	2SA1175	VARIABLE REG OUT	141	1SS119	H STOP GATE
	137	2SC2688	1B CONT	142	1SS119	H STOP GATE
	138	2SC2785	1B CONT	143	1SS119	CLAMP
	139	2SA1175	1B CONT	144	V11N	PULSE PROT
	140	2SC2785	1B DET	145	1SS119	PROT
	141	2SC2785	PULSE DET	146	ERA22-06	PROT
	142	2SK929	VARIABLE REG OUT	149	1SS119	PROT

E [H OUT]

– E BOARD –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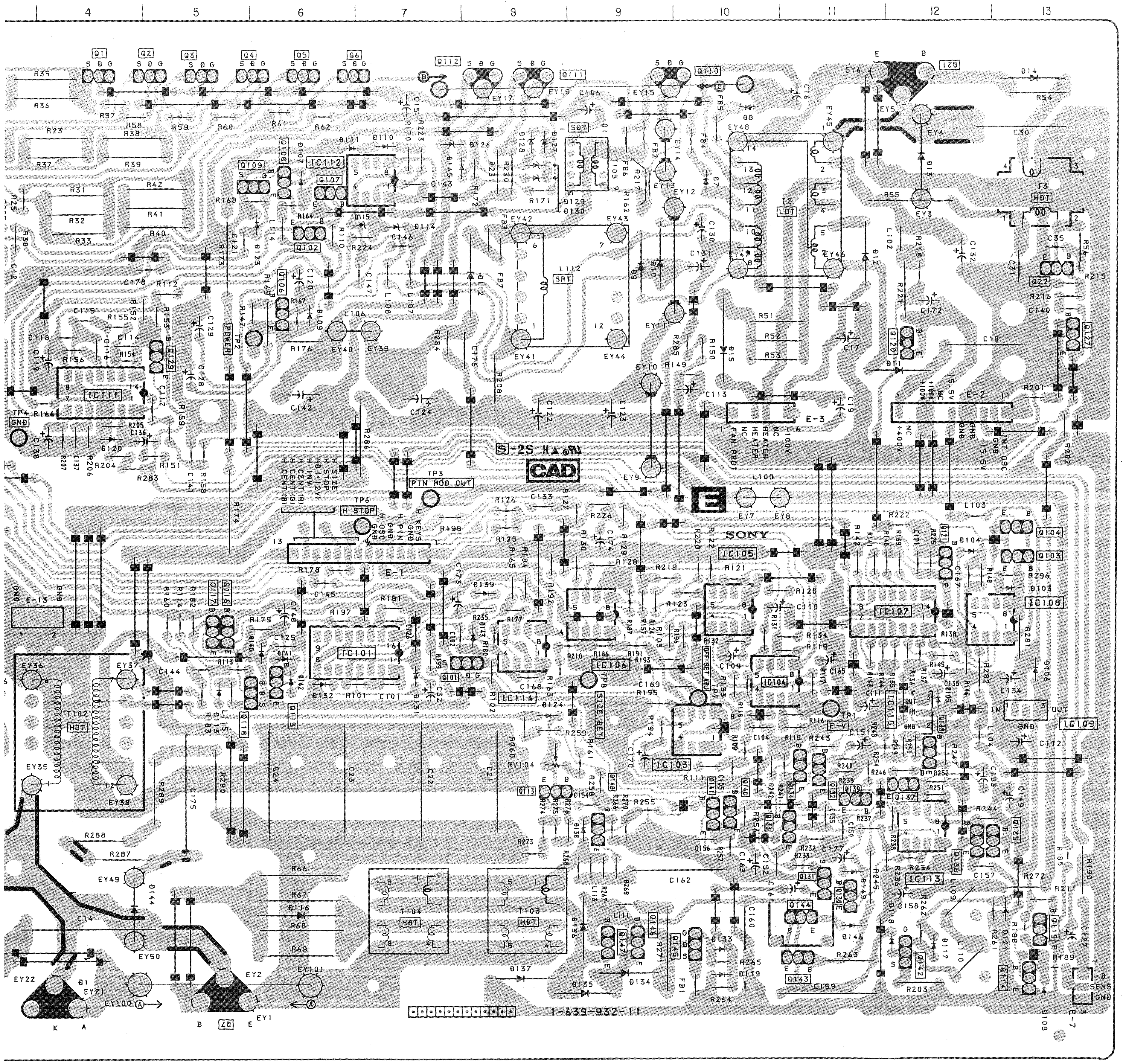
A
B
C
D
E
F
G
H
I
J
IC1
IC2
IC3
IC101
IC103
IC104
IC105
IC106
IC107
IC108
IC109
IC110
IC111
IC112
IC113
IC114
T2 LOT
T3 HOT
T102 HOT
T103 HOT
T104 HOT
L112 SRT
SRT
E-1
E-2
E-3
E-13
TP1 F-V
TP3 PIN H06 OUT
TP4 GND
TP5 GND
TP6 H STOP
TP8 SIZE DET
TP2 POWER
S-2S
CAD
SONY
1-639-932-11

E [H OUT]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Q1
Q2
Q3
Q4
Q5
Q6
Q112
Q111
Q110
IC1
EY6
EY5
EY4
EY3
T3
HOT
T2
LOT
C30
IC112
IC111
IC101
IC106
IC114
IC103
IC105
IC104
IC110
IC107
IC108
IC109
IC113
E-1
E-2
E-3
E-13
T102
HOT
T104
HOT
T103
HOT
TP3
PIN HOB OUT
TP6
H STOP
TP4
GND
S-2S
CAD
E
SONY
POWER
OFF SET ADJ
SIZE DET
F-V
EY1
EY2
EY22
EY21
EY100
EY101
1-639-932-11
SENS
GND
E-7

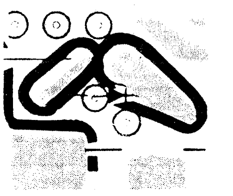
E BOARD

IC	
IC1	B-1
IC2	C-2
IC3	C-3
IC101	F-6
IC103	G-10
IC104	G-10
IC105	F-10
IC106	F-9
IC107	F-12
IC108	F-13
IC109	G-13
IC110	G-12
IC111	D-4
IC112	B-6
IC113	H-12
IC114	F-8

TRANSISTOR	
Q1	A-4
Q2	A-5
Q3	A-5
Q4	A-5
Q5	A-6
Q6	A-6
Q7	J-5
Q21	A-12
Q22	C-13
Q101	G-7
Q102	C-6
Q103	F-13
Q104	E-13
Q106	C-6
Q107	B-6
Q108	B-6
Q109	B-6
Q110	A-10
Q111	A-8
Q112	A-8
Q113	H-8
Q115	G-6
Q116	F-5
Q117	F-5
Q118	G-5
Q120	D-12
Q121	F-12
Q127	D-13
Q128	E-2
Q129	D-5
Q130	I-11
Q131	I-11
Q132	H-11
Q133	H-11
Q134	H-11
Q135	H-13
Q136	H-12
Q137	H-12
Q138	G-12
Q139	H-11
Q140	H-10
Q141	H-10
Q142	I-12
Q143	I-11
Q144	I-11
Q145	I-10
Q146	I-9
Q147	I-9
Q148	H-9

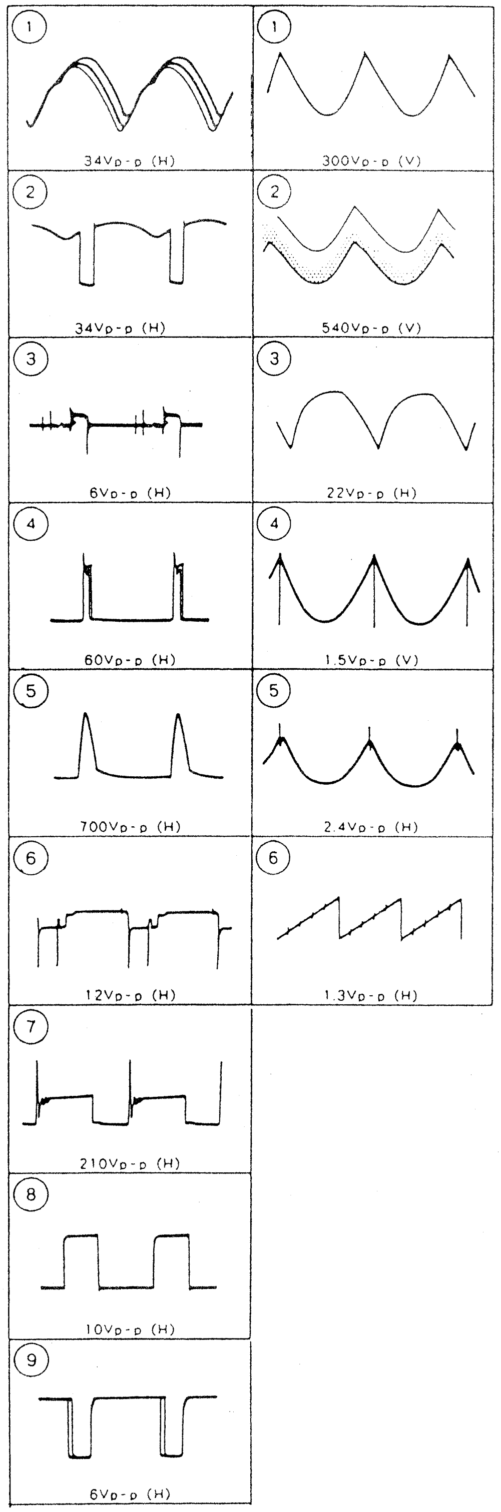
DIODE	
D1	J-4
D7	B-10
D8	A-10
D9	C-9
D10	C-9
D11	D-12
D12	C-11
D13	B-12
D14	A-13
D15	D-10
D103	F-13
D104	F-12
D105	G-12
D106	G-13
D107	B-6
D109	C-6
D110	B-7
D111	B-6
D112	C-8
D113	G-5
D114	B-7
D115	B-7
D116	I-6
D117	I-12
D118	I-11
D119	J-10
D120	D-4
D121	I-13
D122	E-2
D123	B-6
D124	G-8
D126	B-7
D127	B-8
D128	B-8
D129	B-8
D130	B-8
D131	G-7
D132	G-6
D133	I-10
D134	J-9
D135	J-9
D136	I-9
D137	J-8
D138	H-9
D139	F-8
D140	F-6
D141	F-6
D142	G-6
D143	F-8
D144	I-4
D145	B-7
D146	I-11
D149	I-11

VARIABLE RESISTOR	
RV104	H-8



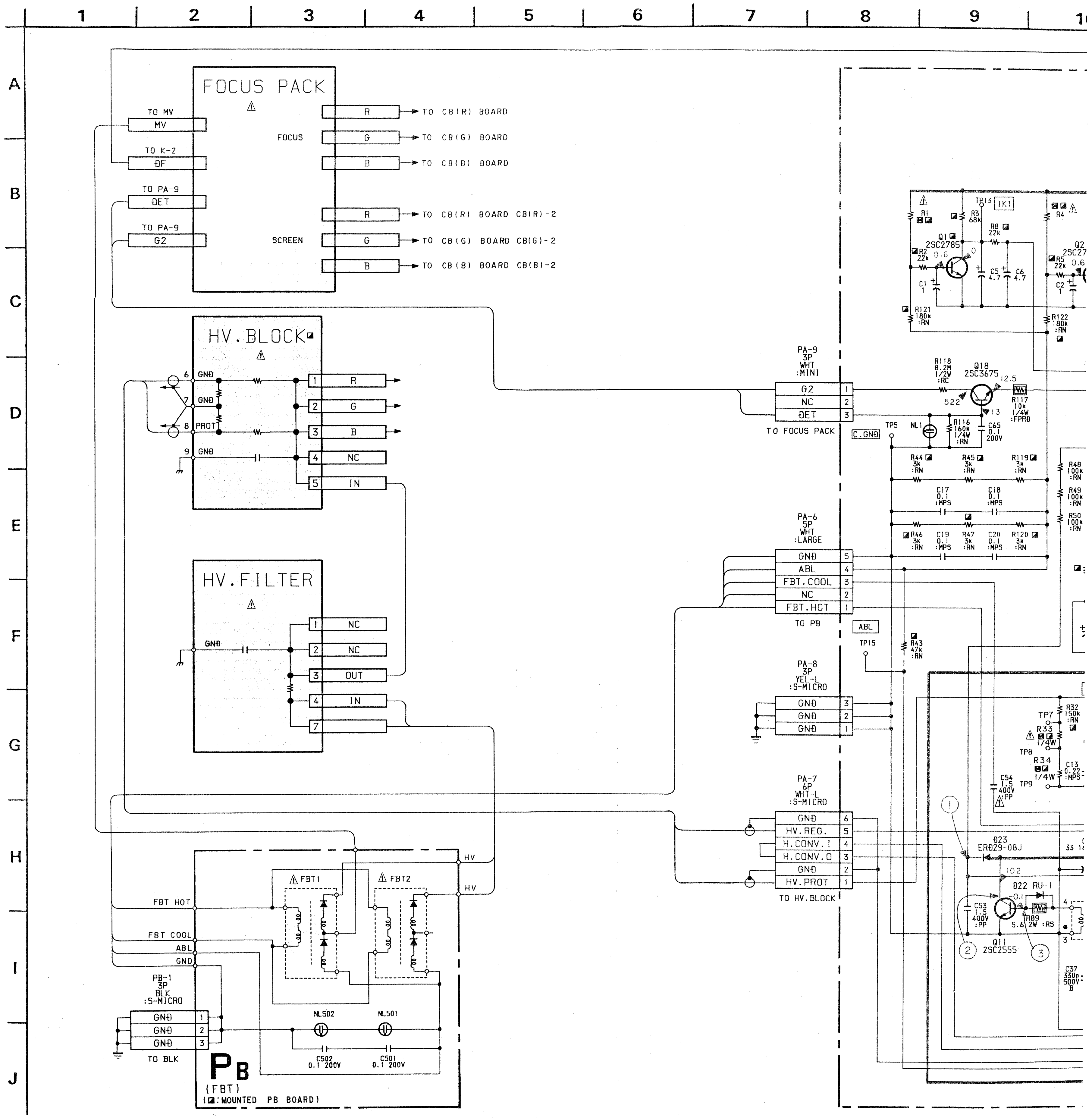
NOTE:

The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.



PA	IC1(1/2)	TL082CP	HV REG DET
	1(2/2)	TL082CP	LOW B PROT
	2(1/2)	LM393P	HV PROT DET
	2(2/2)	LM393P	HV PROT
	3(1/2)	LM393P	REG UP PROT
	3(2/2)	LM393P	ΣIk PROT
	4(1/2)	LM393P	HV PROT BUFF
	4(2/2)	LM393P	ΣIk PROT BUFF
	5	LM7812CT	+12V REG
	6	μPC1394C	HV REG CONTROL
	7	MC14040BCP	OSC DEV-1
	8	MC14572UBCP	OSC DEV-2
	9	TL431CLP	HV REG REF
	Q1	2SC2785	ΣIk DET-1
	2	2SC2785	ΣIk DET-2
	3	2SA1175	OSC BUFF-1
	4	2SA1175	OSC BUFF-2
	5	2SC2688	HV REG DRIVE
	6	2SC2688	HV CONV DRIVE
	7	2SC2785	HV STOP SW-1
	8	2SC2785	HV STOP SW-2
	10	2SD1887	HV CONV
	11	2SC2555	HV REG
	12	2SA1175	POWER ON RESET
	13	2SA1175	POWER OFF RESET
	15	2SC2785	POWER CONT
	16	2SC2785	STOP BUFF
	17	2SC2785	STOP INV
	18	2SC3675	G2 REG
	20	2SA1175	REG OSC BUFF
	D3	1SS119	ΣIk SW
	4	1SS119	ΣIk HOLD
	5	RD5.1ESB2	ΣIk ZENER
	6	1SS119	REG STOP SW-1
	7	1SS119	REG STOP SW-2
	8	1SS119	REG STOP SW-3
	9	1SS119	HV PROT HOLD
	10	RD5.1ESB2	LOW B PROT ZENER
	11	1SS119	LOW B PROT SW
	12	RD5.1ESB2	HV PROT ZENER
	13	1SS119	+12V HOLD
	14	RD5.1ESB2	REG PROT
	16	1SS119	OSC CLAMP
	18	1SS119	+12V PROT
	20	ERC06-15SA	DUMPER-1
	21	ERC06-15SA	DUMPER-2
	22	RU-1	SPEED UP
	23	ERD29-08J	HV REG RECT
	24	1SS119	STOP SW-1
	25	1SS119	STOP SW-2
	28	1SS119	STOP SW-3
	29	1SS119	STOP SW-4
	31	1SS119	DIS CHARGE
	32	V06C	+15V RECT
	35	1SS119	POWER ON RESET

K	IC201	μPC814C	PRE AMP1
	202	μPC814C	PRE AMP2
	Q201	2SA1441	Filter
	202	2SC3421	AMP3
	203	2SK929	AMP2
	204	2SK929	Buffer1
	205	2SD1977	Buffer2
	206	2SB1315	Buffer2
	D201	RD10ES-B2	Protector1
	202	RD10ES-B2	Protector2
	203	ERA22-06	Protector3
	204	1SS119	Therm Cancel
	205	1SS119	Bias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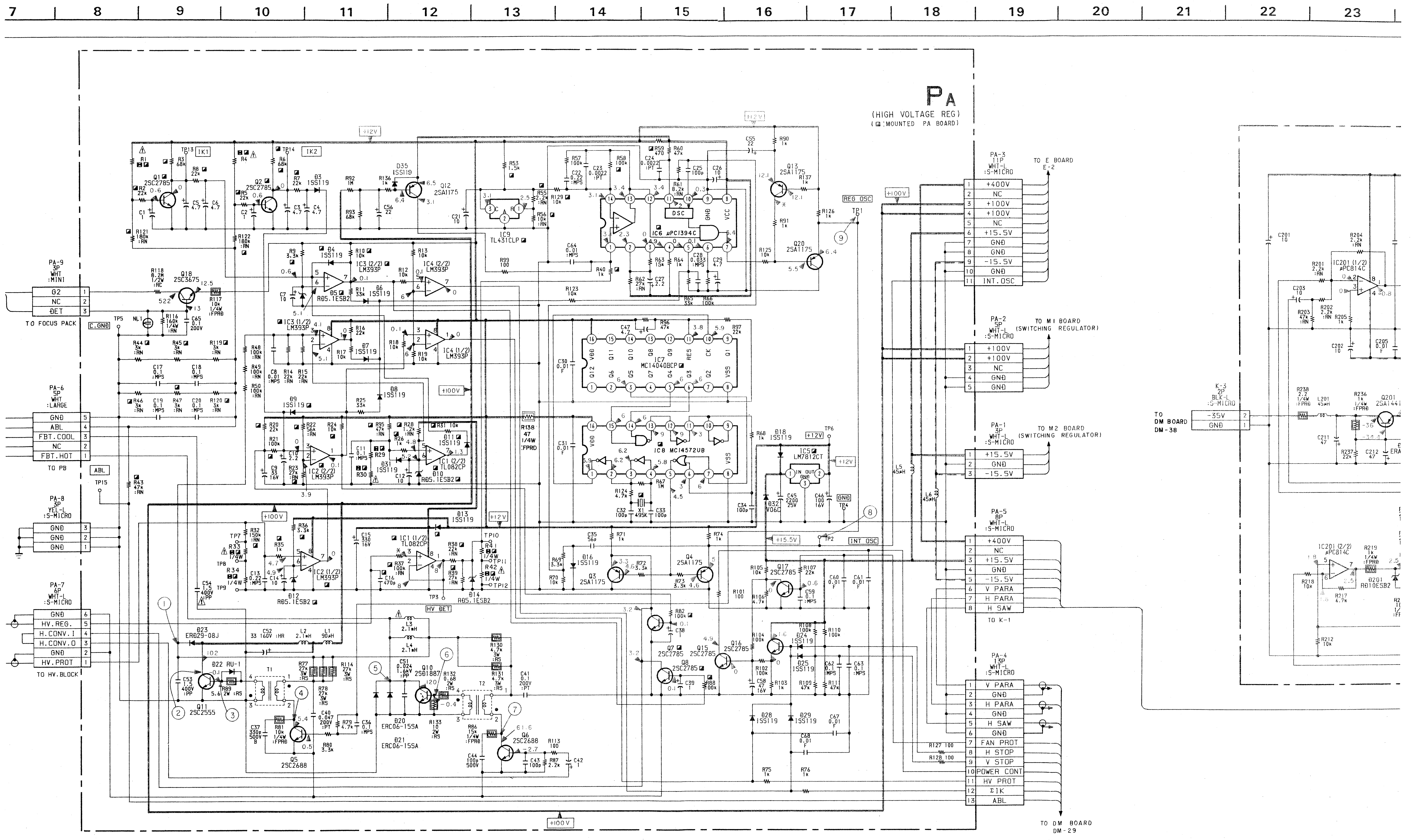
A
B
C
D
E
F
G
H
I
J
FOCUS PACK
TO MV
MV
TO K-2
ØF
TO PA-9
ØET
TO PA-9
G2
FOCUS
SCREEN
R
G
B
TO CB(R) BOARD
TO CB(G) BOARD
TO CB(B) BOARD
TO CB(R) BOARD CB(R)-2
TO CB(G) BOARD CB(G)-2
TO CB(B) BOARD CB(B)-2
HV.BLOCK
GNØ
PROT
NC
IN
HV.FILTER
OUT
PA-9
3P
WHT
:MINI
G2
NC
ØET
TO FOCUS PACK
C.GNØ
TP5
NL1
Q18
2SC3675
R118
8.2M
1/2W
:RC
R117
10k
1/4W
:FPRØ
R116
160k
1/4W
:RN
C65
0.1
200V
PA-6
5P
WHT
:LARGE
GNØ
ABL
FBT.COOL
NC
FBT.HOT
TO PB
ABL
TP15
R43
47k
:RN
PA-8
3P
YEL-L
:S-MICRO
PA-7
6P
WHT-L
:S-MICRO
HV.REG.
H.CONV.I
H.CONV.O
HV.PROT
TO HV.BLOCK
Q1
2SC2785
Q11
2SC2555
D23
ERØ29-08J
D22 RU-1
R89
5.6 2W :RS
C53
1.5
400V
:PP
C54
1.5
400V
:PP
R32
150k
:RN
R33
1/4W
R34
1/4W
C13
0.22
:MPS
TP7
TP8
TP9
R44
R45
R119
R46
R47
R120
C17
C18
C19
C20
R48
R49
R50
R121
180k
:RN
R122
180k
:RN
TP13
IK1
HV
FBT HOT
FBT COOL
ABL
GND
FBT1
FBT2
NL502
NL501
C502
0.1 200V
C501
0.1 200V
PB-1
3P
BLK
:S-MICRO
GNØ
TO BLK
PB
(FBT)
(■:MOUNTED PB BOARD)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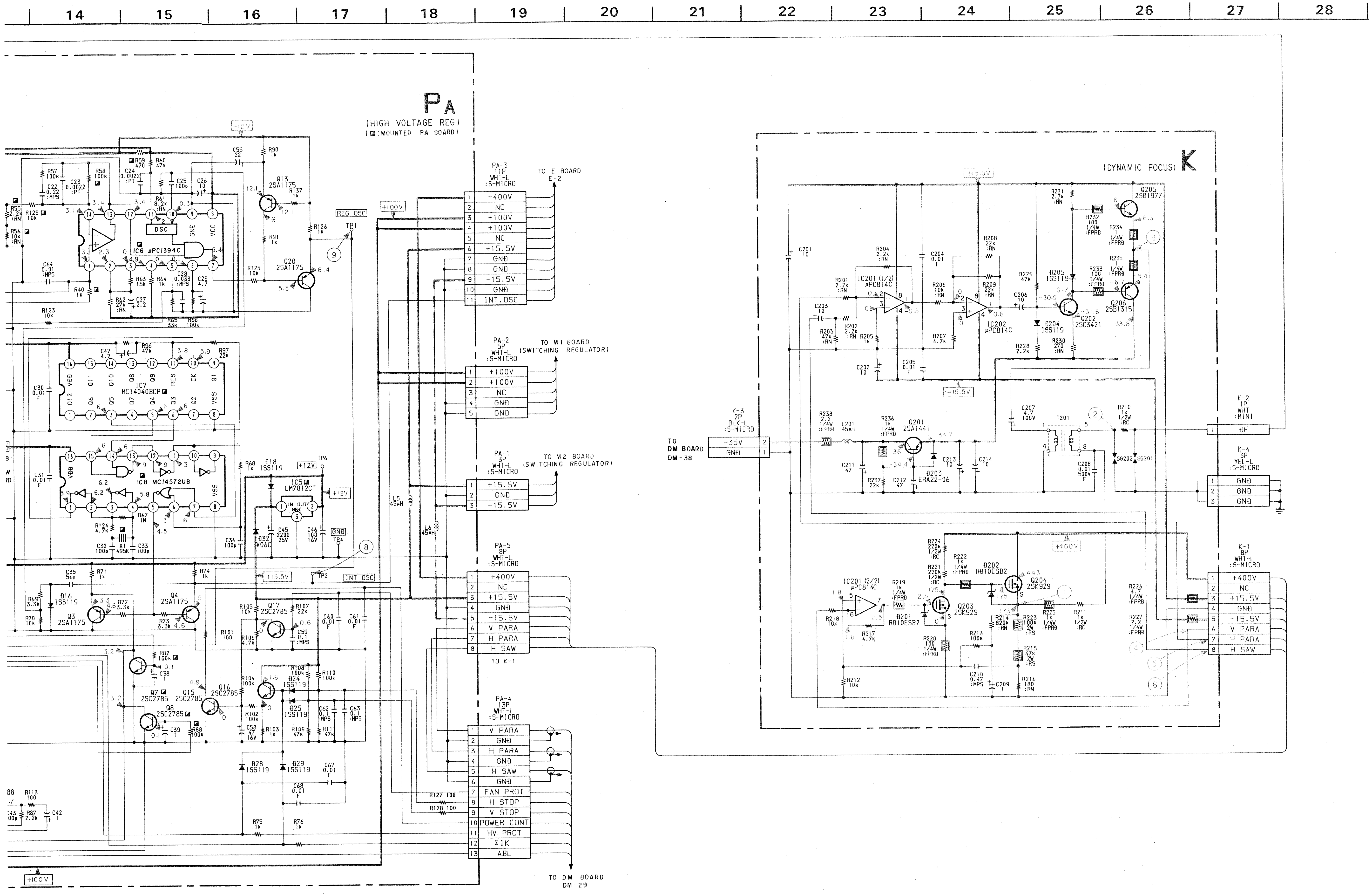
23
PA
(HIGH VOLTAGE REG)
(■:MOUNTED PA BOARD)
PA-9
3P
WHT
:MINI
G2
NC
DET
TO FOCUS PACK
C.GND
PA-6
5P
WHT
:LARGE
GND
ABL
FBT.COOL
NC
FBT.HOT
TO PB
ABL
PA-8
3P
YEL-L
:S-MICRO
GND
GND
GND
PA-7
6P
WHT-L
:S-MICRO
GND
HV.REG.
H.CONV.I
H.CONV.O
GND
HV.PROT
TO HV.BLOCK
IK1
IK2
+12V
+100V
HV DET
REG OSC
INT OSC
IC1 (1/2) TL082CP
IC1 (2/2) TL082CP
IC2 (1/2) LM393P
IC2 (2/2) LM393P
IC3 (1/2) LM393P
IC3 (2/2) LM393P
IC4 (1/2) LM393P
IC4 (2/2) LM393P
IC5 LM7812CT
IC6 μPC1394C
IC7 MC14040BCP
IC8 MC14572UB
IC9 TL431CLP
DSC
PA-3
11P
WHT-L
:S-MICRO
TO E BOARD
E-2
+400V
NC
+100V
+100V
NC
+15.5V
GND
GND
-15.5V
GND
INT.OSC
PA-2
5P
WHT-L
:S-MICRO
TO M1 BOARD
(SWITCHING REGULATOR)
+100V
+100V
NC
GND
GND
PA-1
3P
WHT-L
:S-MICRO
TO M2 BOARD
(SWITCHING REGULATOR)
+15.5V
GND
-15.5V
PA-5
8P
WHT-L
:S-MICRO
+400V
NC
+15.5V
GND
-15.5V
V PARA
H PARA
H SAW
TO K-1
PA-4
13P
WHT-L
:S-MICRO
V PARA
GND
H PARA
GND
H SAW
GND
FAN PROT
H STOP
V STOP
POWER CONT
HV PROT
ΣIK
ABL
TO DM BOARD
DM-29
K-3
2P
BLK-L
:S-MICRO
TO
DM BOARD
DM-38
-35V
GND
IC201 (1/2) μPC814C
IC201 (2/2) μPC814C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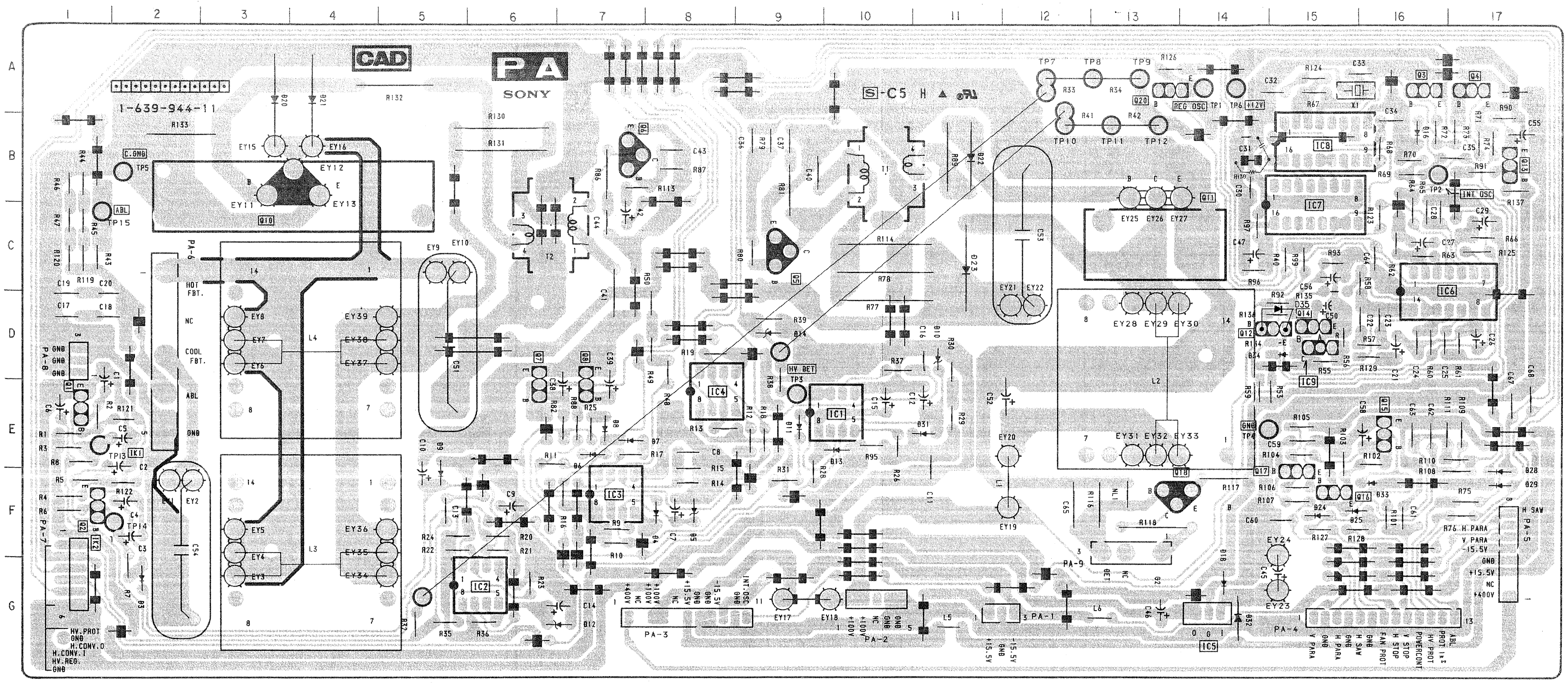
28
PA
(HIGH VOLTAGE REG)
(◪ : MOUNTED PA BOARD)
K
(DYNAMIC FOCUS)
IC6 μPC1394C
IC7 MC14040BCP
IC8 MC14572UB
IC5 LM7812CT
Q13 2SA1175
Q20 2SA1175
Q3 2SA1175
Q4 2SA1175
Q7 2SC2785
Q8 2SC2785
Q15 2SC2785
Q16 2SC2785
Q17 2SC2785
REG OSC
TP1
TP2
TP4
TP6
INT OSC
PA-3 11P WHT-L :S-MICRO
TO E BOARD E-2
+400V
NC
+100V
+100V
NC
+15.5V
GND
GND
-15.5V
GND
INT.OSC
PA-2 5P WHT-L :S-MICRO
TO M1 BOARD (SWITCHING REGULATOR)
PA-1 3P WHT-L :S-MICRO
TO M2 BOARD (SWITCHING REGULATOR)
PA-5 8P WHT-L :S-MICRO
V PARA
H PARA
H SAW
TO K-1
PA-4 13P WHT-L :S-MICRO
FAN PROT
H STOP
V STOP
POWER CONT
HV PROT
ΣIK
ABL
TO DM BOARD DM-29
IC201 (1/2) μPC814C
IC202 μPC814C
IC201 (2/2) μPC814C
Q205 2SD1977
Q206 2SB1315
Q202 2SC3421
Q201 2SA1441
Q203 2SK929
Q204 2SK929
T201
K-3 2P BLK-L :S-MICRO
-35V
GND
TO DM BOARD DM-38
K-2 1P WHT :MINI
DF
K-4 3P YEL-L :S-MICRO
K-1 8P WHT-L :S-MICRO
+15.5V
-15.5V
+400V

PA [HIGH VOLTAGE REG]

– PA BOARD –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A
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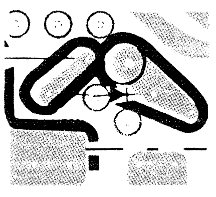
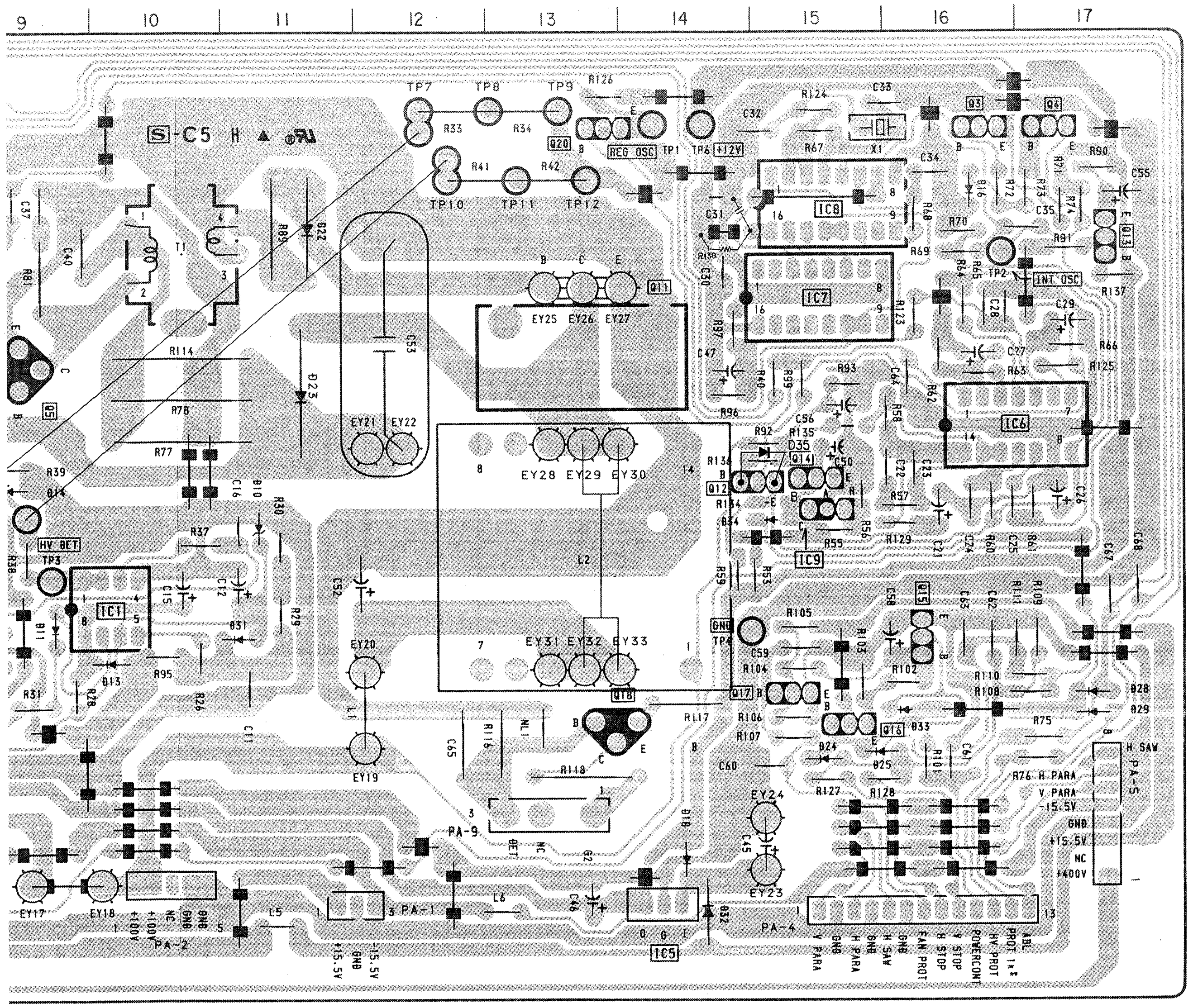
C
D
E
F
G
CAD
PA
SONY
1-639-944-11
S-C5 H
C.GND
TP5
ABL
TP15
Q10
EY11
EY12
EY13
EY15
EY16
EY1
EY2
EY3
EY4
EY5
EY6
EY7
EY8
EY9
EY10
EY17
EY18
EY19
EY20
EY21
EY22
EY23
EY24
EY25
EY26
EY27
EY28
EY29
EY30
EY31
EY32
EY33
EY34
EY35
EY36
EY37
EY38
EY39
L1
L2
L3
L4
L5
L6
T1
T2
HV.BET
TP3
TP7
TP8
TP9
TP10
TP11
TP12
REG OSC
INT OSC
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
HOT FBT.
NC
COOL FBT.
ABL
GND
PA-1
PA-2
PA-3
PA-4
PA-5
PA-6
PA-7
PA-8
PA-9
HV.PROT
GND
H.CONV.O
H.CONV.I
HV.REG.
GND
+400V
NC
+100V
+15.5V
-15.5V
INT.OSC
H SAW
R76 H PARA
V PARA
V PARA
H PARA
H SAW
H STOP
V STOP
FAN PROT
POWERCONT
HV PROT
PROT 1±2
ABL

PA BOARD

IC	
IC1	E-10
IC2	G-6
IC3	F-7
IC4	E-8
IC5	G-14
IC6	C-16
IC7	C-15
IC8	B-15
IC9	D-15
TRANSISTOR	
Q1	E-1
Q2	F-1
Q3	A-16
Q4	A-17
Q5	C-9
Q6	B-7
Q7	D-6
Q8	D-7
Q10	B-4
Q11	B-13
Q12	D-15
Q13	B-17
Q15	E-16
Q16	F-15
Q17	F-15
Q18	F-13
Q20	A-13
DIODE	
D3	G-2
D4	F-8
D5	F-8
D6	E-7
D7	E-7
D8	E-7
D9	F-5
D35	D-15
D10	D-11
D11	E-9
D12	G-7
D13	E-10
D14	D-9
D16	B-16
D18	G-14
D20	A-3
D21	A-4
D22	B-11
D23	C-11
D24	F-15
D25	F-15
D28	F-17
D29	F-17
D31	E-11
D32	G-14
D35	D-15



NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.


9
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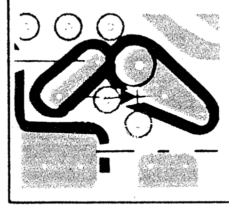
16
17
S-C5 H ▲
TP7
TP8
TP9
TP10
TP11
TP12
REG OSC
INT OSC
HV DET
IC1
IC5
IC6
IC7
IC8
IC9
EY17
EY18
EY19
EY20
EY21
EY22
EY23
EY24
EY25 EY26 EY27
EY28 EY29 EY30
EY31 EY32 EY33
PA-1
PA-2
PA-4
PA-5
PA-9
H SAW
H PARA
V PARA
-15.5V
GND
+15.5V
NC
+400V

PA BOARD

IC	
IC1	E-10
IC2	G-6
IC3	F-7
IC4	E-8
IC5	G-14
IC6	C-16
IC7	C-15
IC8	B-15
IC9	D-15
TRANSISTOR	
Q1	E-1
Q2	F-1
Q3	A-16
Q4	A-17
Q5	C-9
Q6	B-7
Q7	D-6
Q8	D-7
Q10	B-4
Q11	B-13
Q12	D-15
Q13	B-17
Q15	E-16
Q16	F-15
Q17	F-15
Q18	F-13
Q20	A-13
DIODE	
D3	G-2
D4	F-8
D5	F-8
D6	E-7
D7	E-7
D8	E-7
D9	F-5
D35	D-15
D10	D-11
D11	E-9
D12	G-7
D13	E-10
D14	D-9
D16	B-16
D18	G-14
D20	A-3
D21	A-4
D22	B-11
D23	C-11
D24	F-15
D25	F-15
D28	F-17
D29	F-17
D31	E-11
D32	G-14
D35	D-15

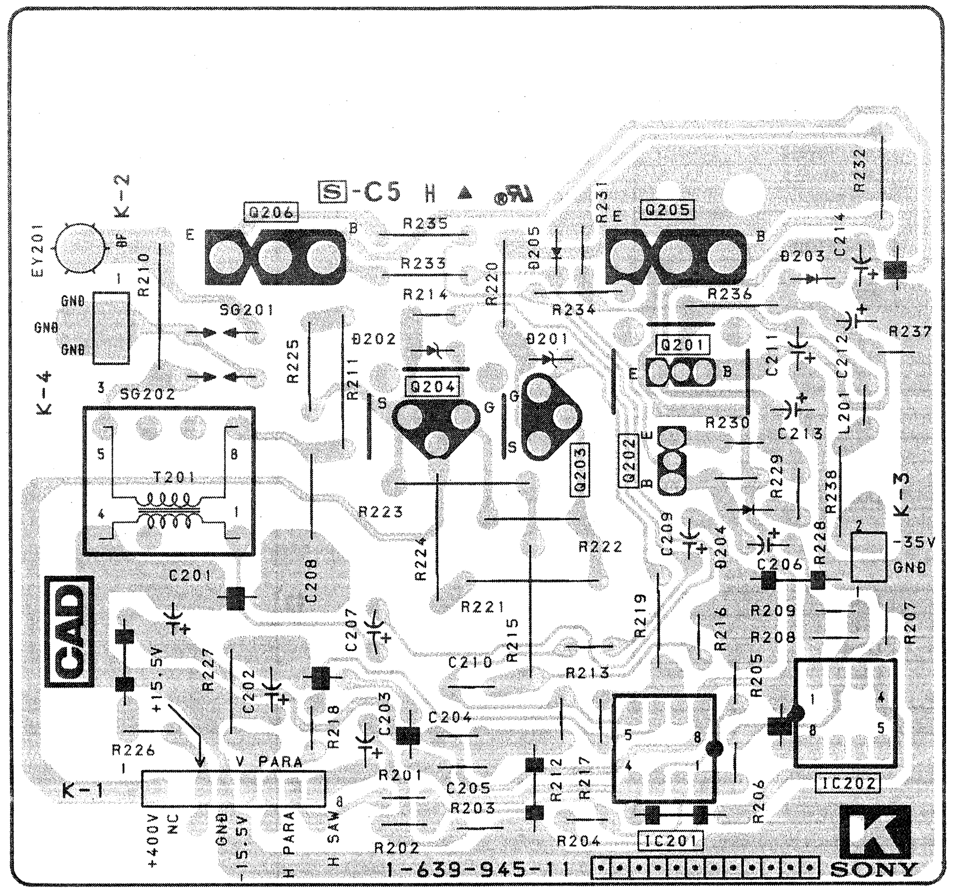


NOTE:

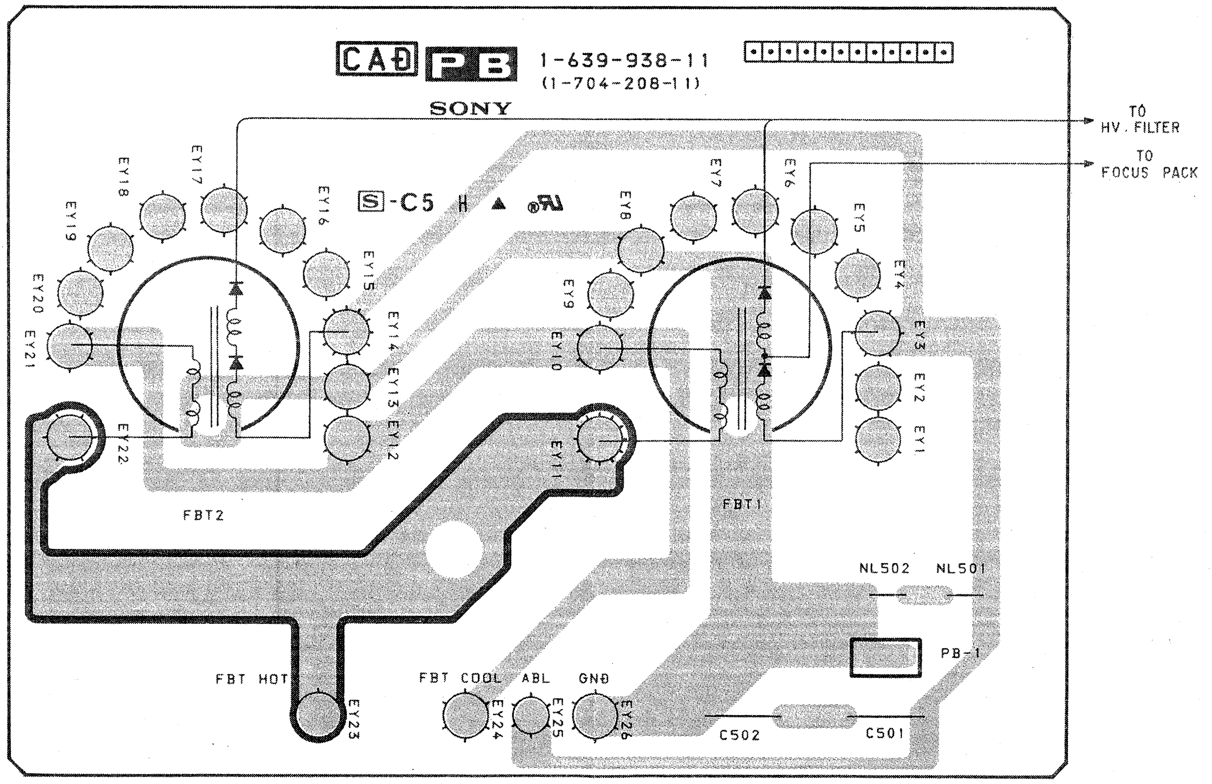
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

K [DYNAMIC FOCUS] **PB** [FBT]

– K BOARD –


S-C5 H ▲
K-1
K-2
K-3
K-4
EY201
SG201
SG202
T201
Q201
Q202
Q203
Q204
Q205
Q206
IC201
IC202
CAD
+15.5V
V PARA
+400V
NC
GND
-15.5V
H PARA
H SAW
-35V
1-639-945-11
K
SONY

– PB BOARD –


CAD PB 1-639-938-11
(1-704-208-11)
SONY
S-C5 H ▲
TO HV. FILTER
TO FOCUS PACK
FBT1
FBT2
EY1
EY2
EY3
EY4
EY5
EY6
EY7
EY8
EY9
EY10
EY11
EY12
EY13
EY14
EY15
EY16
EY17
EY18
EY19
EY20
EY21
EY22
EY23
EY24
EY25
EY26
NL502
NL501
PB-1
FBT HOT
FBT COOL
ABL
GND
C502
C501

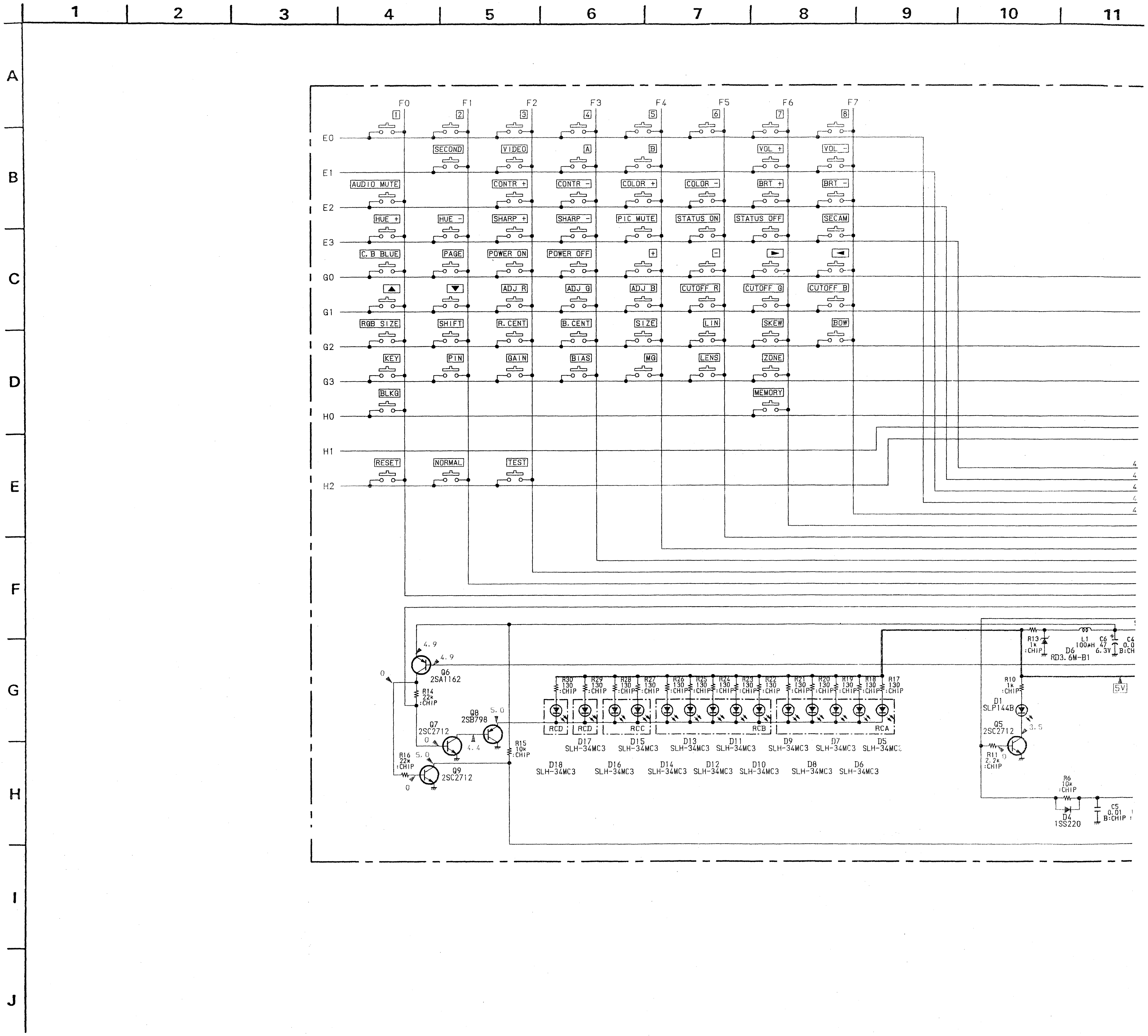
RC	IC1	M50461-157SP	SIRCS ENCODER
	Q1	2SA1162	SIRCS BUFF2
	2	2SC2712	SIRCS BUFF1
	5	2SC2712	INDICATOR DRIVE
	6	2SA1162	LED SW1
	7	2SC2712	LED DRIVE 1
	8	2SB798	LED DRIVE 2
	9	2SC2712	LED SW2
	D1	SLP144B	INDICATOR
	4	1SS220	
	6	RD3.6M-B1	VCC CONT

RCA	D5	SLH-34MC3	LIGHT
	6	SLH-34MC3	LIGHT
	7	SLH-34MC3	LIGHT
	8	SLH-34MC3	LIGHT
	9	SLH-34MC3	LIGHT

RCB	D10	SLH-34MC3	LIGHT
	11	SLH-34MC3	LIGHT
	12	SLH-34MC3	LIGHT
	13	SLH-34MC3	LIGHT
	14	SLH-34MC3	LIGHT

RCC	D15	SLH-34MC3	LIGHT
	16	SLH-34MC3	LIGHT

RCD	D1	SLH-34MC3	LIGHT


1
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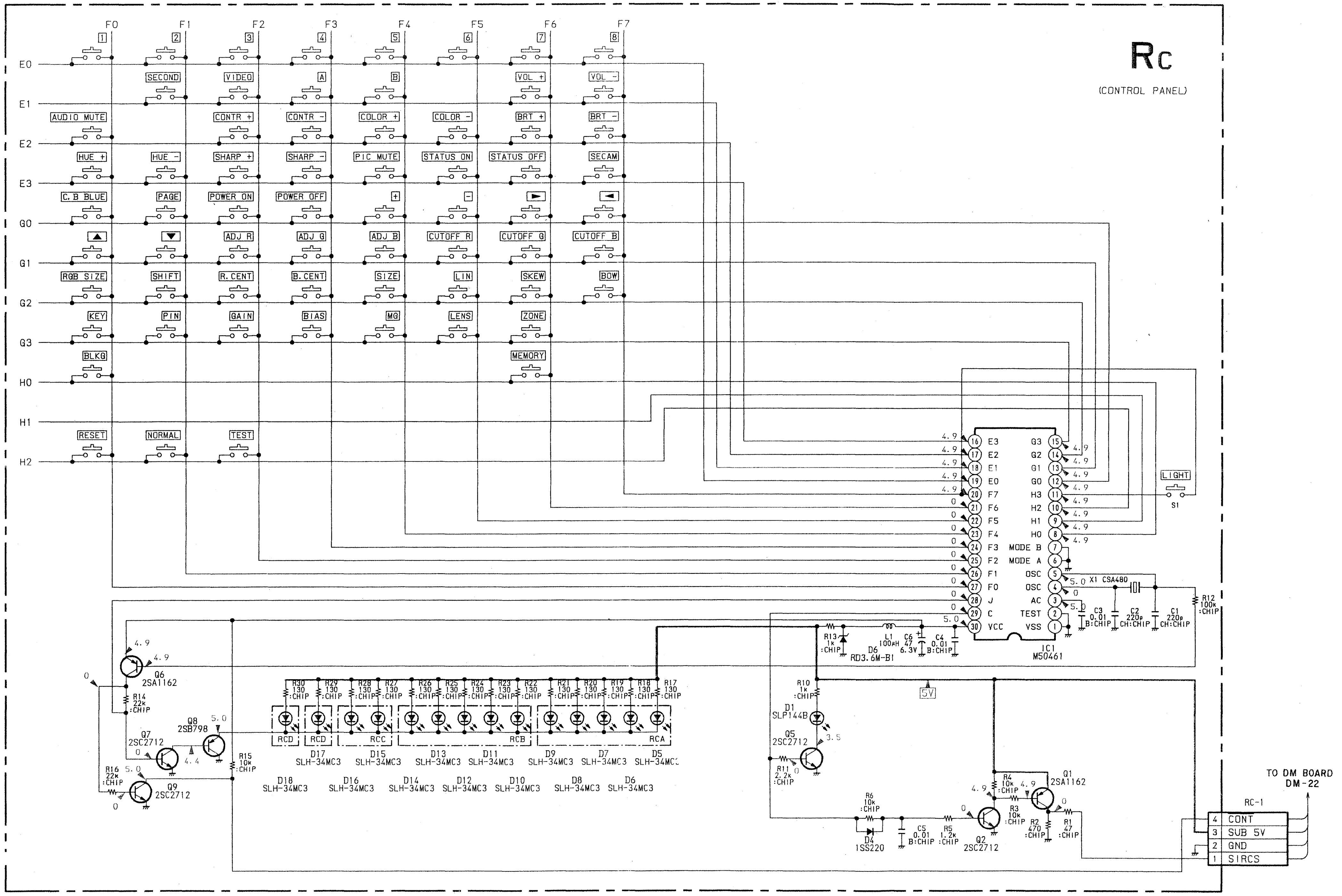
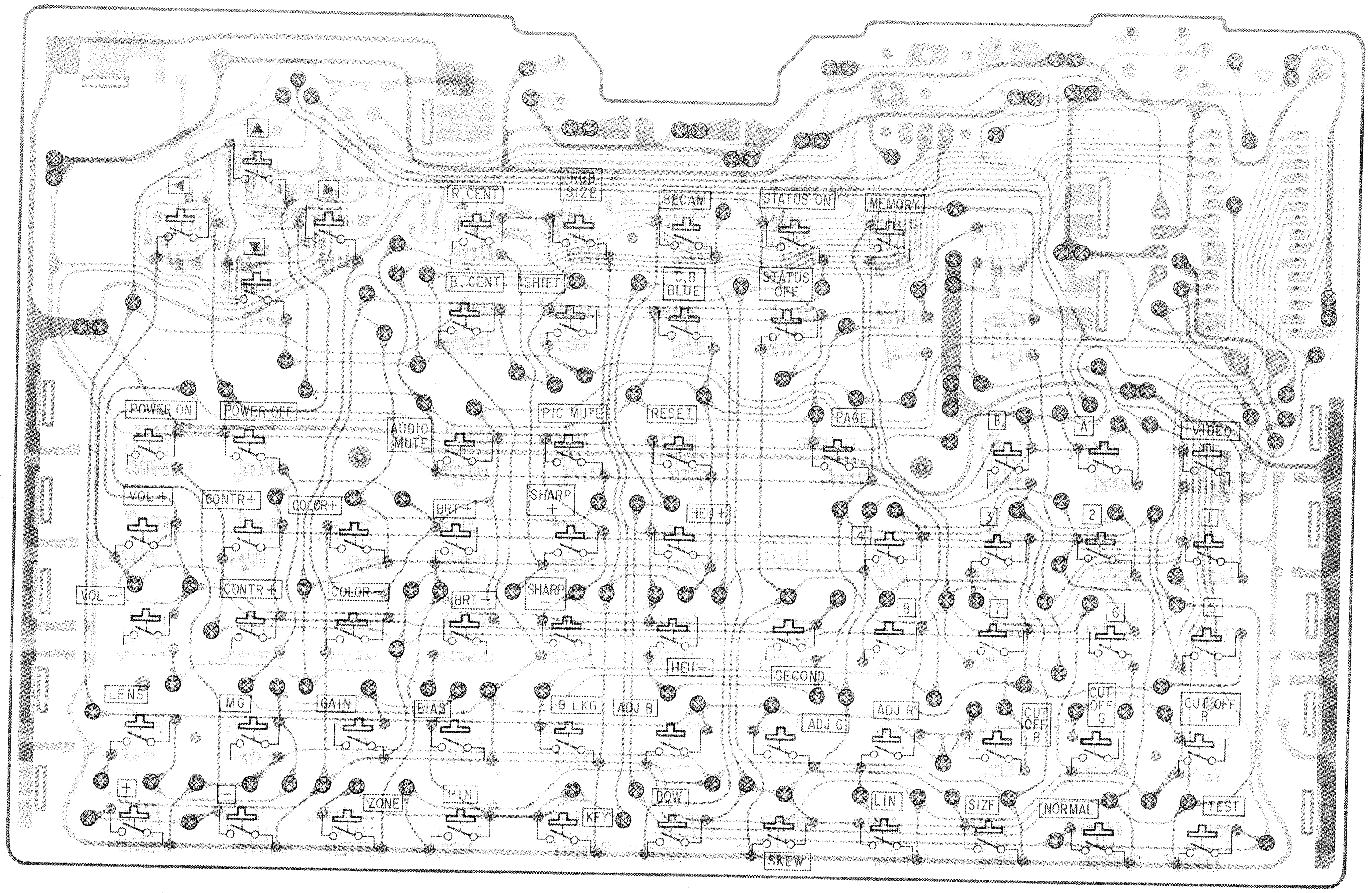
8
9
10
11
A
B
C
D
E
F
G
H
I
J
F0
F1
F2
F3
F4
F5
F6
F7
E0
E1
E2
E3
G0
G1
G2
G3
H0
H1
H2
1
2
3
4
5
6
7
8
SECOND
VIDEO
A
B
VOL +
VOL -
AUDIO MUTE
CONTR +
CONTR -
COLOR +
COLOR -
BRT +
BRT -
HUE +
HUE -
SHARP +
SHARP -
PIC MUTE
STATUS ON
STATUS OFF
SECAM
C, B BLUE
PAGE
POWER ON
POWER OFF
+
-
▲
▼
ADJ R
ADJ G
ADJ B
CUTOFF R
CUTOFF G
CUTOFF B
RGB SIZE
SHIFT
R. CENT
B. CENT
SIZE
LIN
SKEW
BOW
KEY
PIN
GAIN
BIAS
MG
LENS
ZONE
BLKG
MEMORY
RESET
NORMAL
TEST
Q6 2SA1162
4.9
R14 22k :CHIP
Q7 2SC2712
Q8 2SB798
5.0
4.4
R15 10k :CHIP
R16 22k :CHIP
Q9 2SC2712
R17–R30 130 :CHIP
RCD
RCC
RCB
RCA
D5 SLH-34MC3
D6 SLH-34MC3
D7 SLH-34MC3
D8 SLH-34MC3
D9 SLH-34MC3
D10 SLH-34MC3
D11 SLH-34MC3
D12 SLH-34MC3
D13 SLH-34MC3
D14 SLH-34MC3
D15 SLH-34MC3
D16 SLH-34MC3
D17 SLH-34MC3
D18 SLH-34MC3
R13 1k :CHIP
D6 RD3.6M-B1
L1 100μH
C6 47 6.3V
C4
R10 1k :CHIP
D1 SLP144B
Q5 2SC2712
3.5
R11 2.2k :CHIP
5V
R6 10k :CHIP
D4 1SS220
C5 0.01 B:CHIP

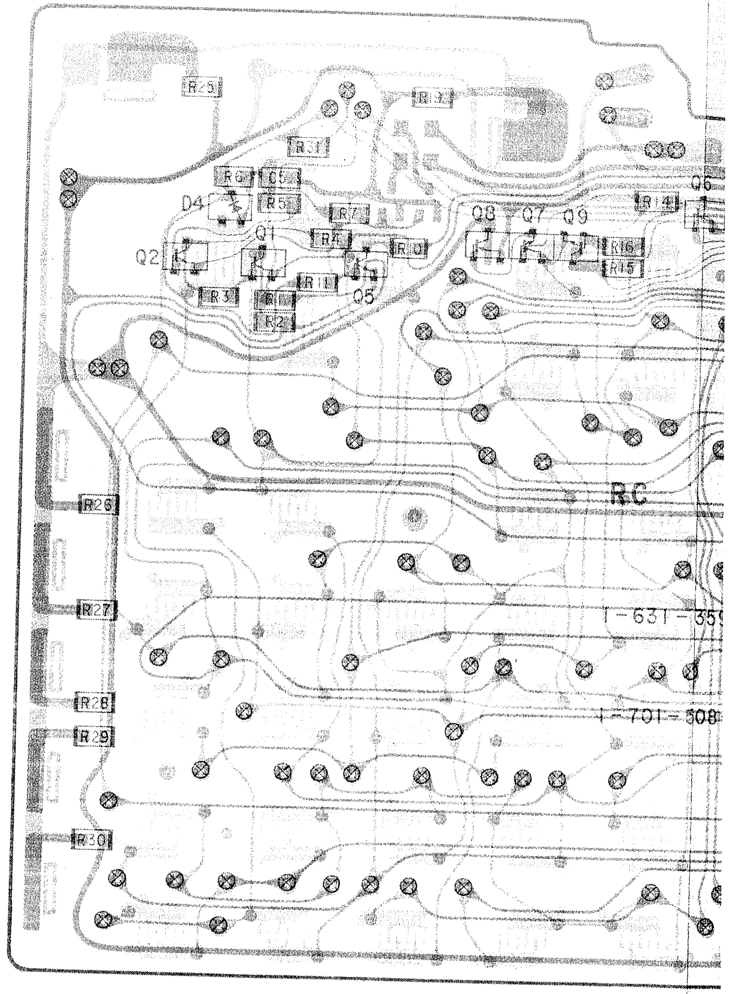

Rc
(CONTROL PANEL)
F0
F1
F2
F3
F4
F5
F6
F7
1
2
3
4
5
6
7
8
E0
E1
E2
E3
G0
G1
G2
G3
H0
H1
H2
SECOND
VIDEO
A
B
VOL +
VOL −
AUDIO MUTE
CONTR +
CONTR −
COLOR +
COLOR −
BRT +
BRT −
HUE +
HUE −
SHARP +
SHARP −
PIC MUTE
STATUS ON
STATUS OFF
SECAM
C.B BLUE
PAGE
POWER ON
POWER OFF
+
−
►
◄
▲
▼
ADJ R
ADJ G
ADJ B
CUTOFF R
CUTOFF G
CUTOFF B
RGB SIZE
SHIFT
R.CENT
B.CENT
SIZE
LIN
SKEW
BOW
KEY
PIN
GAIN
BIAS
MG
LENS
ZONE
BLKG
MEMORY
RESET
NORMAL
TEST
LIGHT
S1
E3
E2
E1
E0
F7
F6
F5
F4
F3
F2
F1
F0
J
C
VCC
G3
G2
G1
G0
H3
H2
H1
H0
MODE B
MODE A
OSC
OSC
AC
TEST
VSS
4.9
0
5.0
IC1
M50461
X1 CSA480
C3 0.01 B:CHIP
C2 220p CH:CHIP
C1 220p CH:CHIP
R12 100k :CHIP
R13 1k :CHIP
D6 RD3.6M-B1
L1 100μH
C6 47 6.3V
C4 0.01 B:CHIP
5V
R10 1k :CHIP
D1 SLP144B
Q5 2SC2712
3.5
R11 2.2k :CHIP
R6 10k :CHIP
D4 1SS220
C5 0.01 B:CHIP
R5 1.2k :CHIP
Q2 2SC2712
R4 10k :CHIP
R3 10k :CHIP
Q1 2SA1162
R2 470 :CHIP
R1 47 :CHIP
TO DM BOARD DM-22
RC-1
4 CONT
3 SUB 5V
2 GND
1 SIRCS
Q6 2SA1162
R14 22k :CHIP
Q7 2SC2712
Q8 2SB798
4.4
R15 10k :CHIP
R16 22k :CHIP
Q9 2SC2712
R30 130 :CHIP
R29 130 :CHIP
R28 130 :CHIP
R27 130 :CHIP
R26 130 :CHIP
R25 130 :CHIP
R24 130 :CHIP
R23 130 :CHIP
R22 130 :CHIP
R21 130 :CHIP
R20 130 :CHIP
R19 130 :CHIP
R18 130 :CHIP
R17 130 :CHIP
RCD
RCD
RCC
RCB
RCA
D17 SLH-34MC3
D15 SLH-34MC3
D13 SLH-34MC3
D11 SLH-34MC3
D9 SLH-34MC3
D7 SLH-34MC3
D5 SLH-34MC3
D18 SLH-34MC3
D16 SLH-34MC3
D14 SLH-34MC3
D12 SLH-34MC3
D10 SLH-34MC3
D8 SLH-34MC3
D6 SLH-34MC3

– RC BOARD –

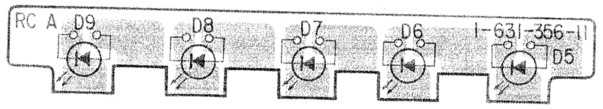

R.CENT
RGB SIZE
SECAM
STATUS ON
MEMORY
B.CENT
SHIFT
C.B BLUE
STATUS OFF
POWER ON
POWER OFF
AUDIO MUTE
PIC MUTE
RESET
PAGE
B
A
VIDEO
VOL +
CONTR +
COLOR +
BRT +
SHARP +
HEN +
4
3
2
1
VOL –
CONTR –
COLOR –
BRT –
SHARP –
HEN –
8
7
6
5
SECOND
LENS
MG
GAIN
BIAS
B LKG
ADJ B
ADJ G
ADJ R
CUT OFF B
CUT OFF G
CUT OFF R
+
–
ZONE
PIN
KEY
BOW
SKEW
LIN
SIZE
NORMAL
TEST

▨ : Conductor side.
▨ : Component side.
▨ : Carbon pattern side.

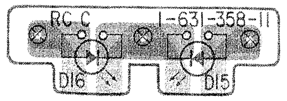
– RC BOARD –


R25
R1
R31
R6
C5
R5
D4
R7
R4
Q8
Q7
Q9
Q6
Q1
Q2
R3
R2
Q5
R16
R15
RC
R26
R27
R28
R29
R30
1-631-35
1-701-308

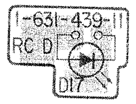
–RC-A BOARD–


RC A
D9
D8
D7
D6
1-631-356-11
D5

–RC-C BOARD–

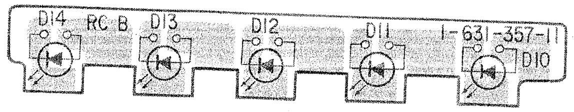

RC C
1-631-358-11
D16
D15

–RC-D BOARD–

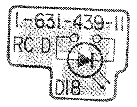

1-631-439-11
RC D
D17

▨ : Pattern from the side which enables seeing.
▨ : Pattern of the rear side.

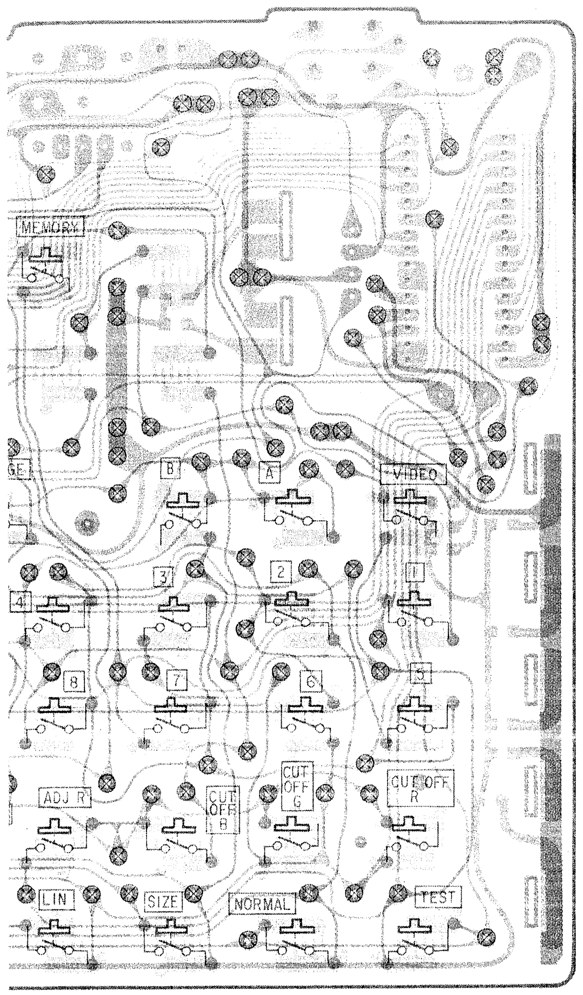
–RC-B BOARD–


D14
RC B
D13
D12
D11
1-631-357-11
D10

–RC-D BOARD–

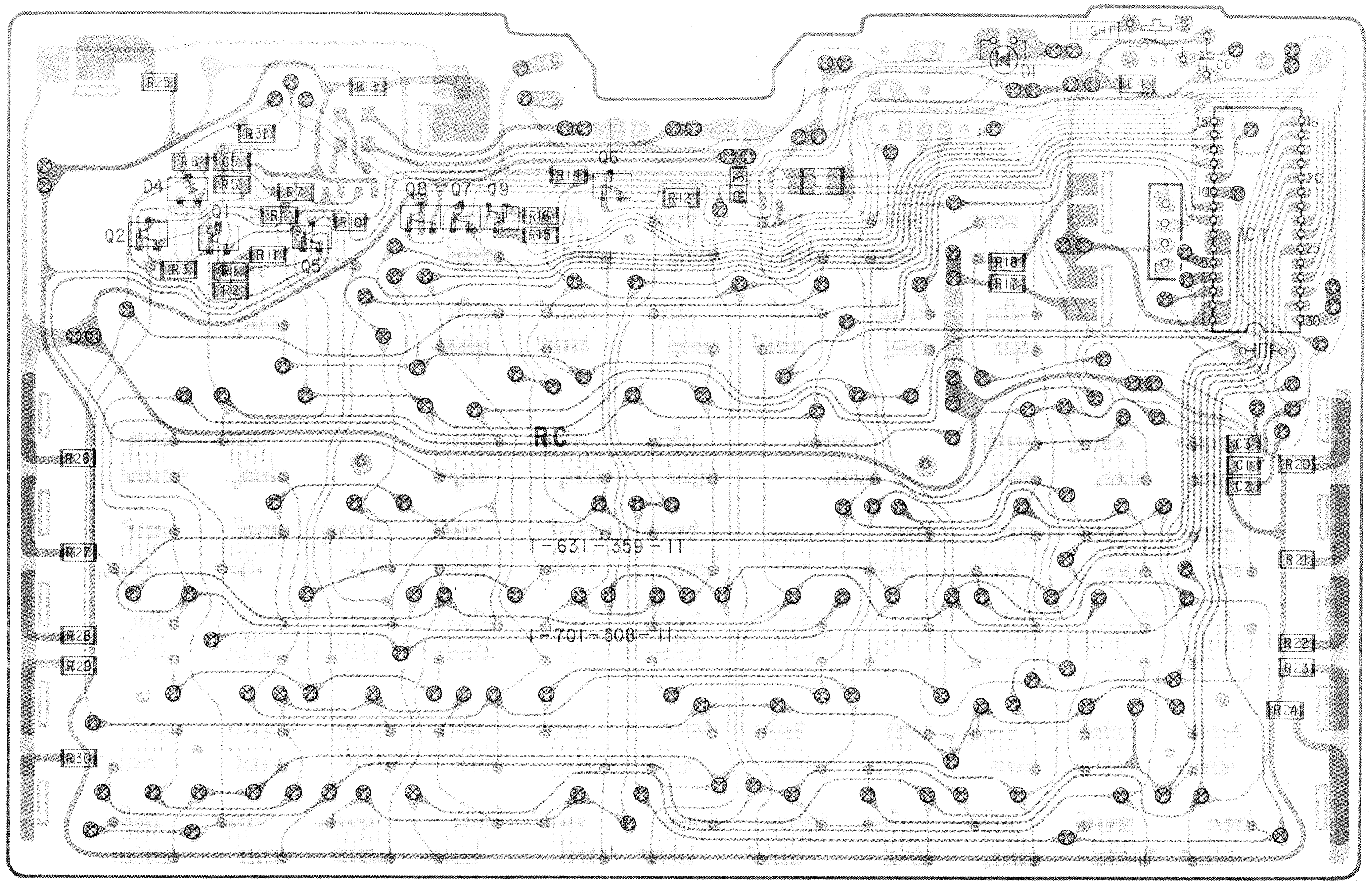

1-631-439-11
RC D
D18

RCC **RCD**


MEMORY
B
A
VIDEO
GE
3
2
1
4
8
7
6
5
ADJ R
CUT OFF B
CUT OFF G
CUT OFF R
LIN
SIZE
NORMAL
TEST

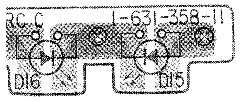
▨ : Conductor side.
▨ : Component side.
▨ : Carbon pattern side.

– RC BOARD –

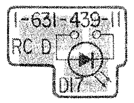

LIGHT
S1
C6
D1
C4
R25
R35
R34
R6
C5
R5
D4
R7
R4
Q1
R10
Q2
R3
R11
R1
R2
Q5
Q8
Q7
Q9
R16
R15
R14
Q6
R12
R13
R18
R17
IC1
1
5
10
15
16
20
25
30
RC
1-631-359-11
1-701-308-11
R26
R27
R28
R29
R30
C3
C1
C2
R20
R31
R22
R23
R24

▨ : Component side.
▨ : Conductor side.
▨ : Carbon pattern side.

-C BOARD–

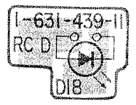

RC C
1-631-358-11
D16
D15

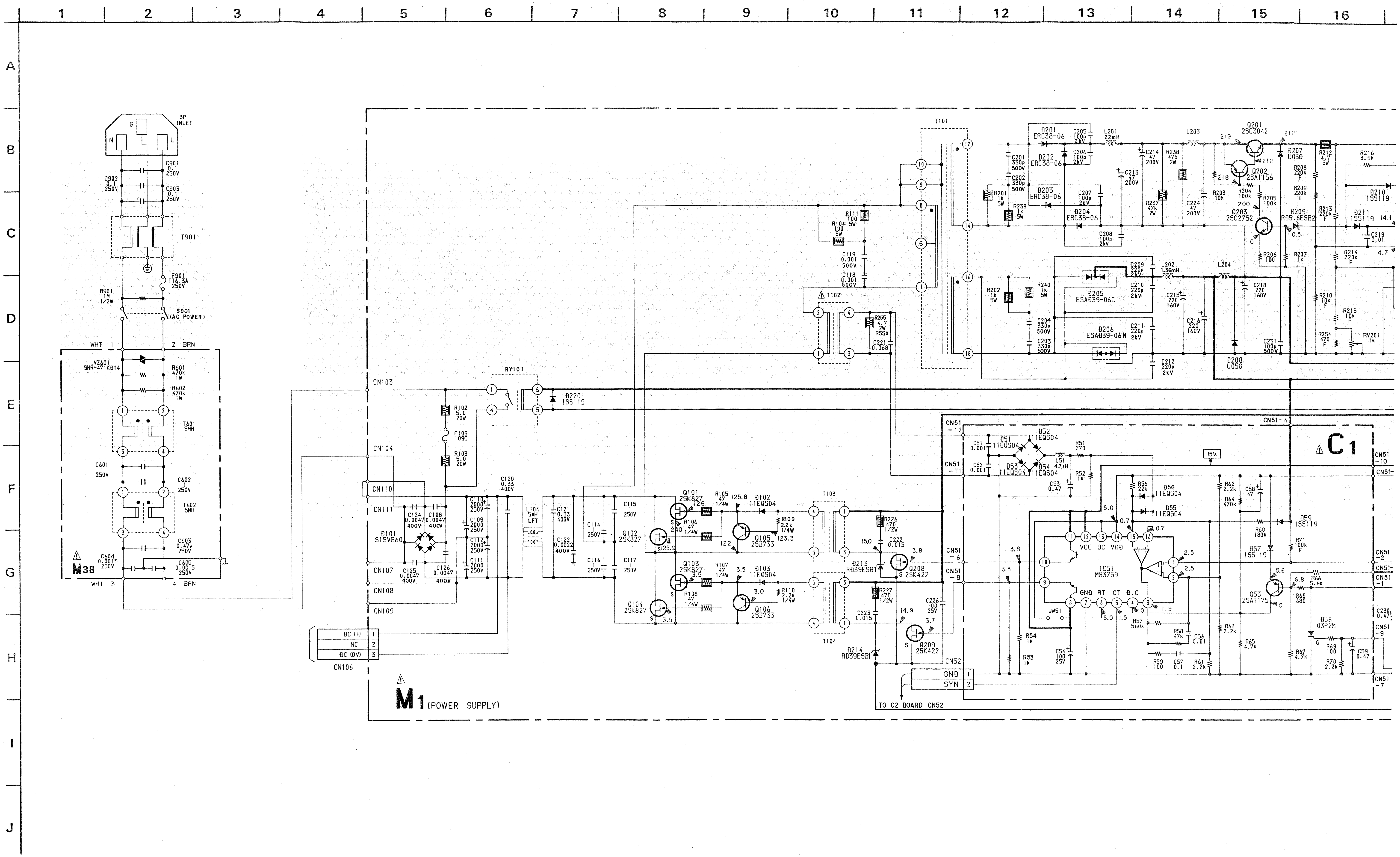
–RC-D BOARD–

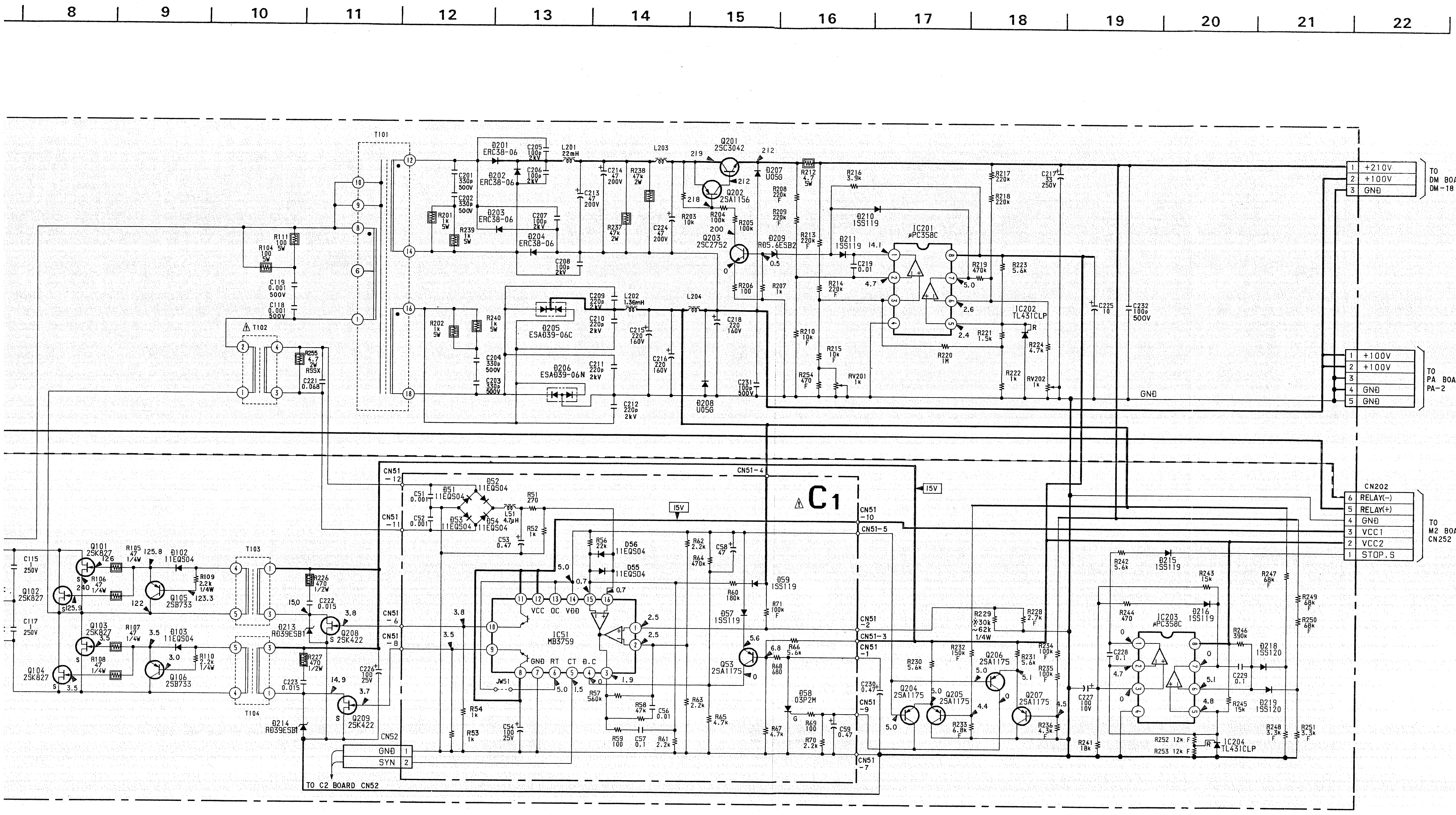

1-631-439-11
RC D
D17

▨ : Pattern from the side which enables seeing.
▨ : Pattern of the rear side.

–RC-D BOARD–


1-631-439-11
RC D
D18


3P INLET
T901
F901 T6.3A 250V
S901 (AC POWER)
R901 1M 1/2W
VZ601 SNR-471KD14
T601 5MH
T602 5MH
M3B
CN103
CN104
CN110
CN111
CN107
CN108
CN109
CN106
DC (+)
NC
DC (0V)
RY101
D220 1SS119
F103
D101 S15VB60
L104 5μH LFT
Q101 2SK827
Q102 2SK827
Q103 2SK827
Q104 2SK827
Q105 2SB733
Q106 2SB733
D102 11EQS04
D103 11EQS04
T101
T102
T103
T104
Q208 2SK422
Q209 2SK422
D213 RD39ESB1
D214 RD39ESB1
M1 (POWER SUPPLY)
D201 ERC38-06
D202 ERC38-06
D203 ERC38-06
D204 ERC38-06
D205 ESAD39-06C
D206 ESAD39-06N
L201 22mH
L202 1.36mH
L203
L204
Q201 2SC3042
Q202 2SA1156
Q203 2SC2752
D207 U05G
D208 U05G
D209 RD5.6ESB2
D210 1SS119
D211 1SS119
RV201 1k
C1
15V
IC51 MB3759
D51 11EQS04
D52 11EQS04
D53 11EQS04
D54 11EQS04
D55 11EQS04
D56 11EQS04
D57 1SS119
D58 03P2M
D59 1SS119
Q53 2SA1175
L51 4.7μH
JW51
CN51
CN52
GND
SYN
TO C2 BOARD CN52


8
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19
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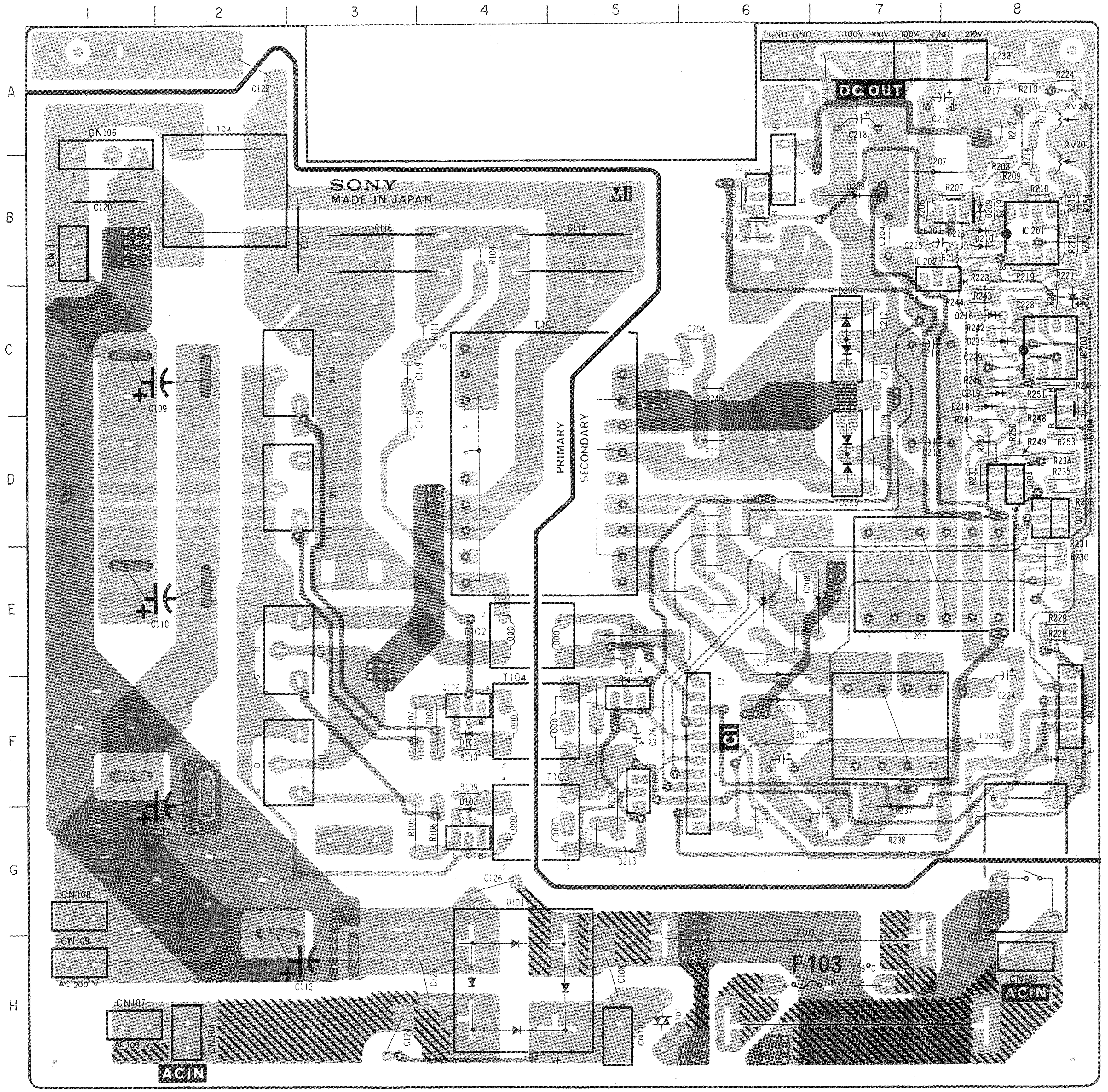
21
22
T101
T102
T103
T104
D201 ERC38-06
D202 ERC38-06
D203 ERC38-06
D204 ERC38-06
D205 ESA039-06C
D206 ESA039-06N
L201 22mH
L202 1.36mH
L203
L204
Q201 2SC3042
Q202 2SA1156
Q203 2SC2752
D207 U05G
D208 U05G
D209 R05.6ESB2
D210 1SS119
D211 1SS119
IC201 μPC358C
IC202 TL431CLP
RV201 1k
RV202 1k
GND
+210V
+100V
TO DM BOARD DM-18
TO PA BOARD PA-2
CN202
RELAY(-)
RELAY(+)
VCC1
VCC2
STOP.S
TO M2 BOARD CN252
C1
15V
CN51
IC51 MB3759
VCC OC VDD
GND RT CT D.C
JW51
D51 11EQS04
D52 11EQS04
D53 11EQS04
D54 11EQS04
D55 11EQS04
D56 11EQS04
D57 1SS119
D58 03P2M
D59 1SS119
Q53 2SA1175
Q101 2SK827
Q102 2SK827
Q103 2SK827
Q104 2SK827
Q105 2SB733
Q106 2SB733
D102 11EQS04
D103 11EQS04
D213 RD39ESB1
D214 RD39ESB1
Q208 2SK422
Q209 2SK422
CN52
SYN
TO C2 BOARD CN52
Q204 2SA1175
Q205 2SA1175
Q206 2SA1175
Q207 2SA1175
IC203 μPC358C
IC204 TL431CLP
D215 1SS119
D216 1SS119
D218 1SS120
D219 1SS120

M1 **M3B** **C1** [POWER SUPPLY]

M1	IC201	μPC358	CMP
	202	TL431C	2.5V REF VOLT
	203	μPC358C	AMP
	204	TL431C	5.0V REF VOLT
	Q101	2SK827	CONV
	102	2SK827	CONV
	103	2SK827	CONV
	104	2SK827	CONV
	105	2SB733	SPEED UP
	106	2SB733	SPEED UP
	201	2SC3042	210V REG
	202	2SA1156	210V REG
	203	2SC2752	210V REG
	204	2SA1175	0V
	205	2SA1175	0V
	206	2SA1175	0V
	207	2SA1175	0V
	208	2SK422	DRIVE
	209	2SK422	DRIVE
	D101	S15VB60	AC RECT
	102	11EQS04	RECT
	103	11EQS04	RECT
	201	ERC38-06	210V RECT
	202	ERC38-06	210V RECT
	203	ERC38-06	210V RECT
	204	ERC38-06	210V RECT
	205	ESAD39-06C	100V RECT
	206	ESAD39-06N	100V RECT
	207	U05G	CLAMP
	208	U05G	CLAMP
	209	RD5.6ESB2	CORRECT
	210	1SS119	DC SHIFT
	211	1SS119	DC SHIFT
	213	RD39ESB	CLAMP
	214	RD39ESB	CLAMP
	215	1SS119	DC SHIFT
	216	1SS119	DC SHIFT
	218	1SS120	PROT
	219	1SS120	PROT
	220	1SS119	PROT

C1	IC51	MB3759	CONTROL
	Q53	2SA1175	AMP
	D51	11EQS04	RECT
	52	11EQS04	RECT
	53	11EQS04	RECT
	54	11EQS04	RECT
	55	11EQS04	CLAMP
	56	11EQS04	CLAMP
	57	1SS119	PROT
	58	03P2M	OFF
	59	1SS119	PROT

– M1 BOARD –

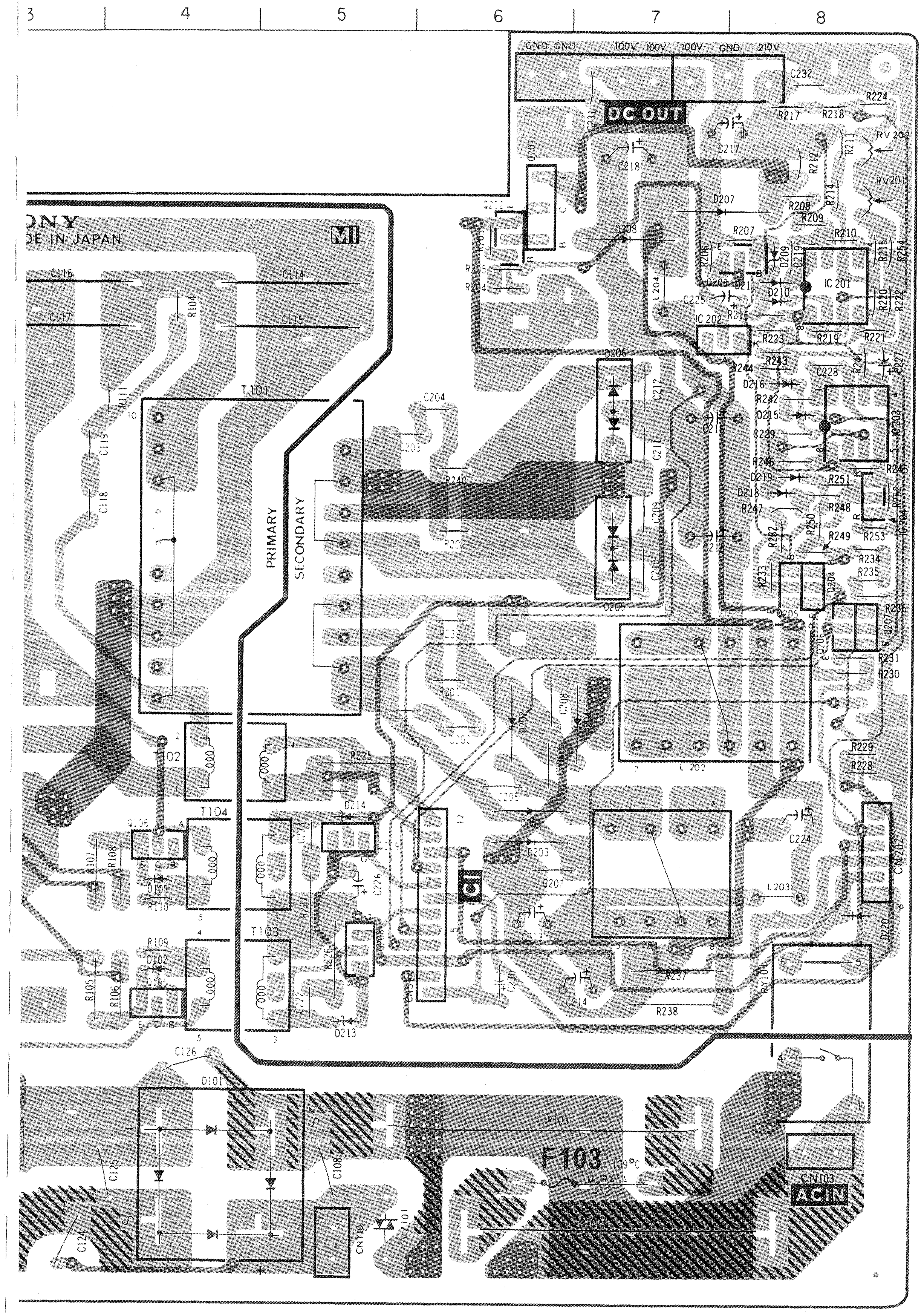


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
GND GND 100V 100V 100V GND 210V
DC OUT
SONY
MADE IN JAPAN
M1
CN106
CN111
L104
C120
C121
C122
C116
C117
C114
C115
R104
R111
C119
C118
T101
PRIMARY
SECONDARY
C109
C110
C111
C112
Q104
Q103
Q102
Q101
T102
T104
T103
R107
R108
R109
R110
R105
R106
D102
D103
C126
C125
C124
C108
D101
CN108
CN109
AC 200 V
CN107
AC100 V
CN104
CN110
ACIN
F103
R103
R102
CN103
ACIN
C1
CN51
C204
C203
R240
C202
R225
D214
D213
C276
R227
R226
C230
C214
D202
D203
D204
D201
C205
C207
L202
L203
R237
R238
R201
R202
C224
CN202
D220
R101
C231
C232
C218
C217
R217
R218
R224
RV202
RV201
R212
R213
R214
R208
R209
D207
D208
R207
R210
R206
R205
R204
R203
Q201
Q202
L204
C225
Q203
D211
D210
D209
IC201
IC202
R216
R215
R220
R232
R223
R243
R219
R221
R244
C228
R241
C227
D206
C212
C211
D216
R242
D215
C216
C229
IC203
R246
R245
D219
R251
D218
R247
R248
R252
R250
R249
R253
IC204
C209
C210
C215
R233
R234
R235
Q204
D205
Q205
Q206
Q207
R236
R231
R230
R229
R228

M1 BOARD

IC	
IC201	B - 8
IC202	B - 7
IC203	C - 8
IC204	D - 8
TRANSISTOR	
Q101	F - 3
Q102	E - 3
Q103	D - 3
Q104	C - 3
Q105	G - 4
Q106	F - 4
Q201	B - 6
Q202	B - 6
Q203	B - 8
Q204	D - 8
Q205	D - 8
Q206	D - 8
Q207	D - 8
Q208	F - 5
Q209	F - 5
DIODE	
D101	H - 4
D102	G - 4
D103	F - 4
D201	F - 6
D202	E - 6
D203	F - 6
D204	E - 7
D205	D - 7
D206	C - 7
D207	B - 7
D208	B - 7
D209	B - 8
D210	B - 8
D211	B - 8
D213	G - 5
D214	F - 5
D215	C - 8
D216	C - 8
D218	C - 8
D219	C - 8
D220	F - 8
ADJUSTING ELEMENT	
RV201	B - 8
RV202	A - 8

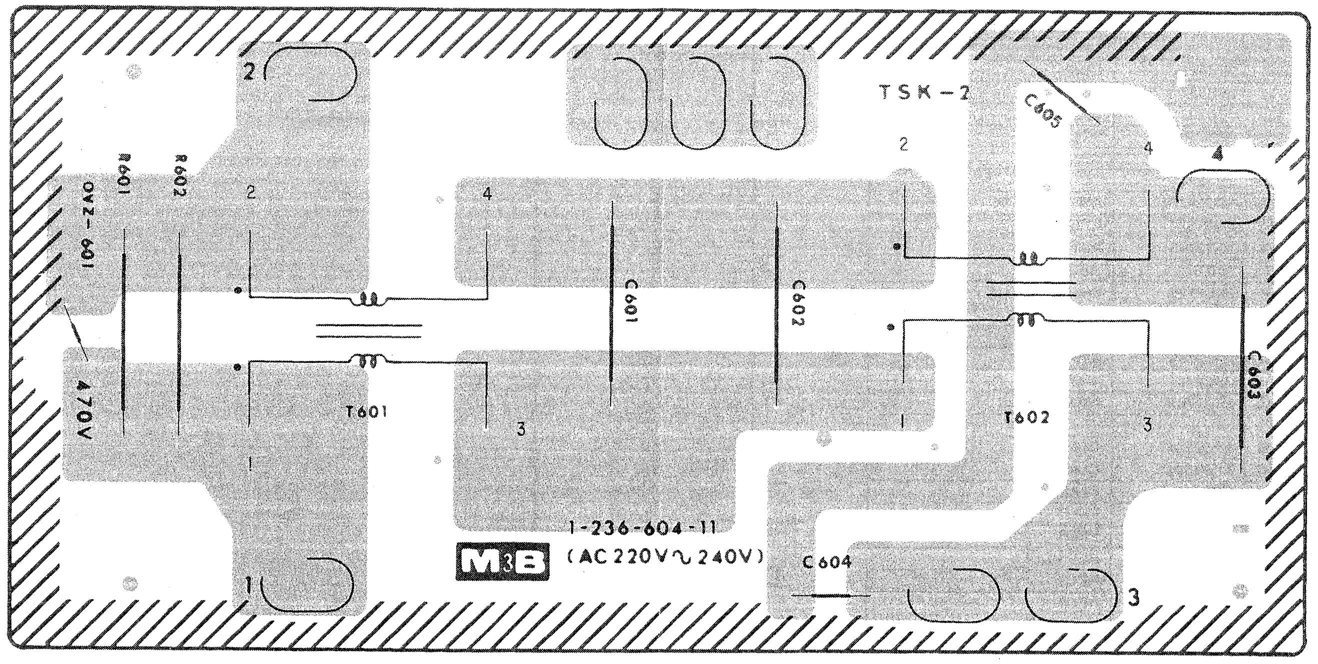
M1 **M3B** **C1** [POWER SUPPLY]


3
4
5
6
7
8
GND GND 100V 100V 100V GND 210V
DC OUT
SONY
MADE IN JAPAN
M1
PRIMARY
SECONDARY
T101
T102
T103
T104
IC201
IC202
IC203
IC204
F103
ACIN
CN103
CN202
C1
D101

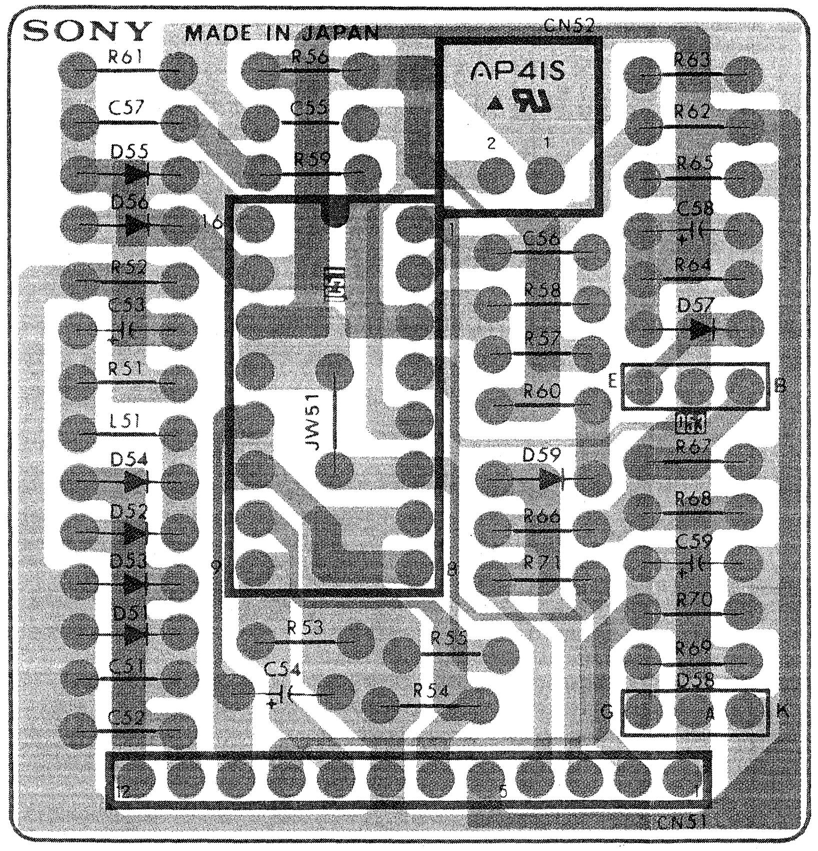
M1 BOARD

IC	
IC201	B - 8
IC202	B - 7
IC203	C - 8
IC204	D - 8
TRANSISTOR	
Q101	F - 3
Q102	E - 3
Q103	D - 3
Q104	C - 3
Q105	G - 4
Q106	F - 4
Q201	B - 6
Q202	B - 6
Q203	B - 8
Q204	D - 8
Q205	D - 8
Q206	D - 8
Q207	D - 8
Q208	F - 5
Q209	F - 5
DIODE	
D101	H - 4
D102	G - 4
D103	F - 4
D201	F - 6
D202	E - 6
D203	F - 6
D204	E - 7
D205	D - 7
D206	C - 7
D207	B - 7
D208	B - 7
D209	B - 8
D210	B - 8
D211	B - 8
D213	G - 5
D214	F - 5
D215	C - 8
D216	C - 8
D218	C - 8
D219	C - 8
D220	F - 8
ADJUSTING ELEMENT	
RV201	B - 8
RV202	A - 8

- M3B BOARD -


TSK-2
C605
R601
R602
VZ-601
470V
T601
C601
C602
T602
C603
C604
1-236-604-11
M3B
(AC 220V∿240V)

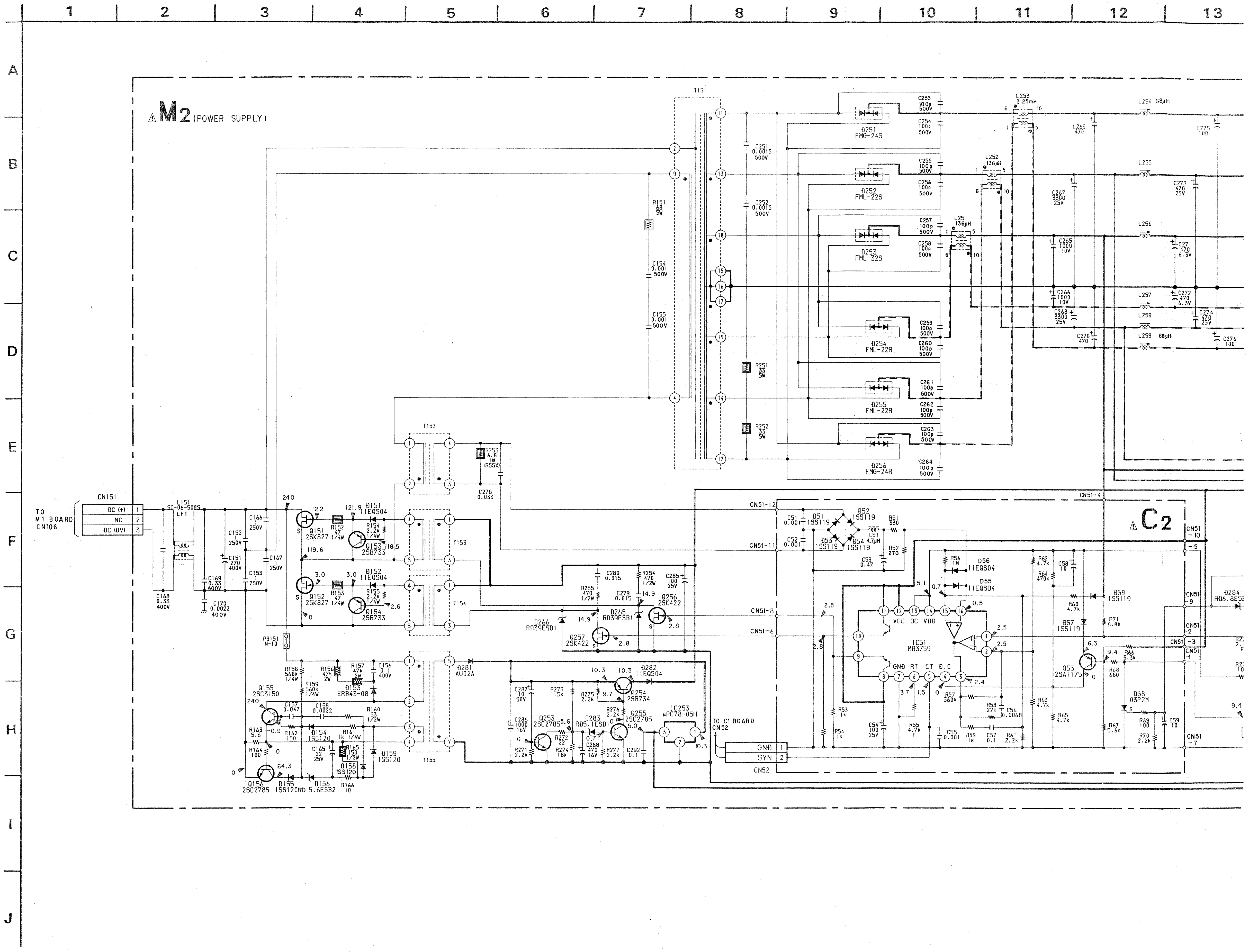
- C1 BOARD -

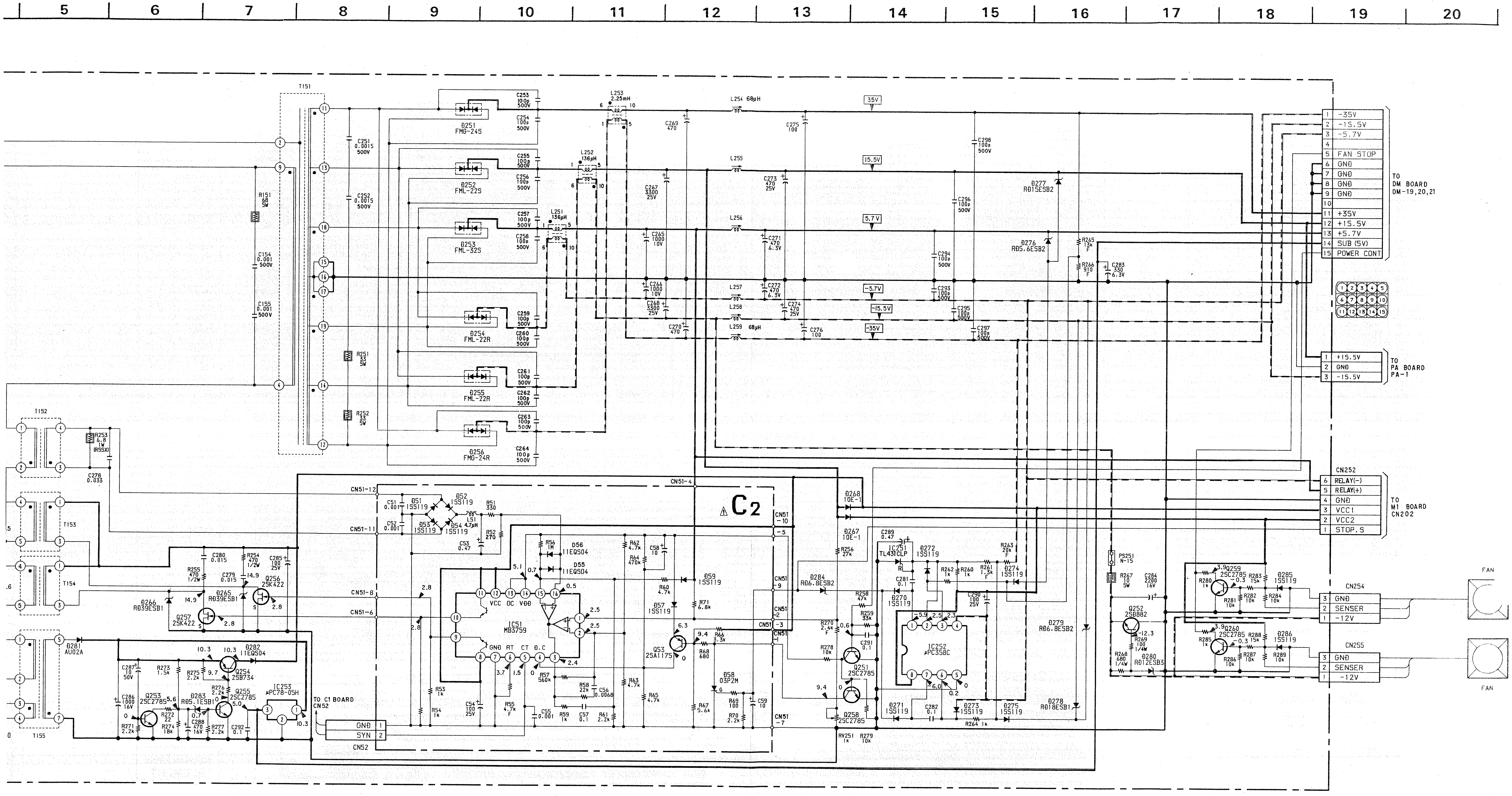

SONY MADE IN JAPAN
CN52
AP41S
CN51
JW51
R61
C57
D55
D56
R52
C53
R51
L51
D54
D52
D53
D51
C51
C52
R56
C55
R59
R53
C54
R55
R54
C56
R58
R57
R60
D59
R66
R71
R63
R62
R65
C58
R64
D57
Q51
R67
R68
C59
R70
R69
D58

- ▒ : Pattern from the side which enables seeing.
- ▓ : Pattern of the rear side.

M2	IC251	TL431C	2.5V REF
	252	μPC358C	AMP
	253	μPC7805H	5V REG
	Q151	2SK827	CONV
	152	2SK827	CONV
	153	2SB733	SPEED UP
	154	2SB733	SPEED UP
	155	2SC3150	CONV
	156	2SC2785	OC
	251	2SC2785	AMP
	252	2SD882	REG
	253	2SC2785	AMP
	254	2SB734	REG
	255	2SC2785	AMP
	256	2SK422	DRIVE
	257	2SK422	DRIVE
	258	2SC2785	AMP
	259	2SC2785	AMP
	260	2SC2785	AMP
	D151	11EQS04	CLAMP
	152	11EQS04	CLAMP
	153	ERB43-08	CLAMP
	154	1SS120	PROT
	155	1SS120	PROT
	156	RD5.6ESB2	REF VOLT
	158	1SS120	RECT
	159	1SS120	RECT
	251	FMG-24S	35V RECT
	252	FML-22S	15.5V RECT
	253	FML-32S	5.7V RECT
	254	FML-22R	–5.7V RECT
	255	FML-22R	–15.5V RECT
	256	FMG-24R	–35V RECT
	265	RD39ESB	CLAMP
	266	RD39ESB	CLAMP
	267	10E-1	PROT
	268	10E-1	PROT
	270	1SS119	DC SHIFT
	271	1SS119	DC SHIFT
	272	1SS119	PROT
	273	1SS119	PROT
	274	1SS119	PROT
	275	1SS119	PROT
	276	RD5.6ESB2	0V
	277	RD15ESB2	0V
	278	RD18ESB1	0V
	279	RD6.8ESB2	0V
	280	RD12ESB3	REF VOLT
	281	AU02A	RECT
	282	11EQS04	PROT
	283	RD5.1ESB1	DC SHIFT
	284	RD6.8ESB2	CLAMP
	285	1SS119	PROT
	286	1SS119	PROT

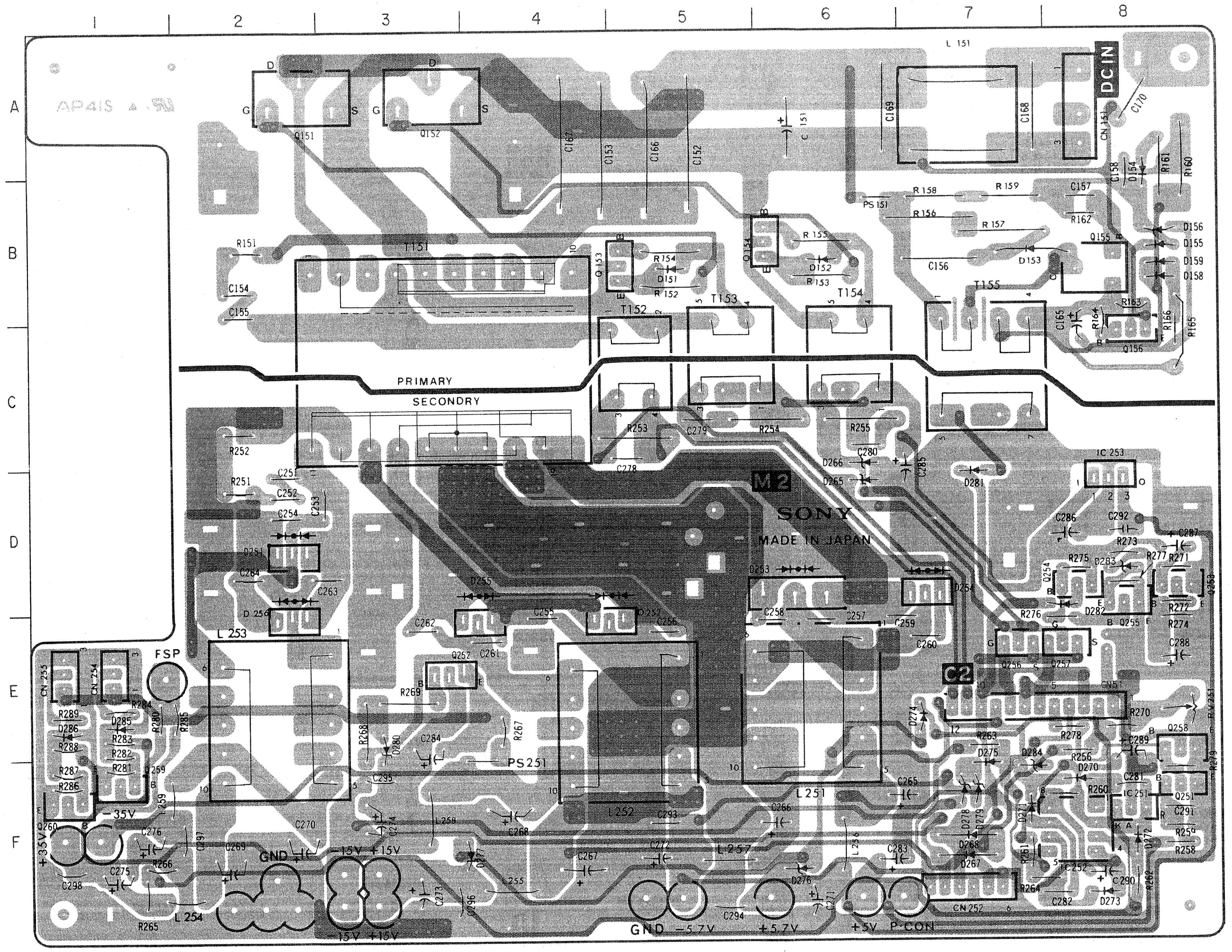
C2	IC51	MB3759	CONTROL
	Q53	2SA1175	AMP
	D51	1SS119	RECT
	52	1SS119	RECT
	53	1SS119	RECT
	54	1SS119	RECT
	55	1SS119	CLAMP
	56	1SS119	CLAMP
	57	1SS119	PROT
	58	03P2M	OFF
	59	1SS119	PROT


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
M2 (POWER SUPPLY)
C2
TO M1 BOARD CN106
CN151
DC (+)
NC
DC (0V)
L151 SC-06-500S LFT
T151
T152
T153
T154
T155
D251 FMG-24S
D252 FML-22S
D253 FML-32S
D254 FML-22R
D255 FML-22R
D256 FMG-24R
L253 2.25mH
L252 136μH
L251 136μH
L254 68μH
L259 68μH
Q151 2SK827
Q152 2SK827
Q153 2SB733
Q154 2SB733
Q155 2SC3150
Q156 2SC2785
Q253 2SC2785
Q254 2SB734
Q255 2SC2785
Q256 2SK422
Q257 2SK422
IC253 μPC78-05H
IC51 MB3759
Q53 2SA1175
D281 AU02A
D282 11EQS04
D151 11EQS04
D152 11EQS04
D153 ERB43-08
D266 RD39ESB1
D265 RD39ESB1
D58 03P2M
PS151 N-10
TO C1 BOARD CN52
GND
SYN
CN52
CN51-12
CN51-11
CN51-8
CN51-6
CN51-4
VCC
OC
VDD
GND
RT
CT
D.C


5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
T151
T152
T153
T154
T155
R151 68 5W
C154 0.001 500V
C155 0.001 500V
C251 0.0015 500V
C252 0.0015 500V
R251 33 5W
R252 33 5W
R253 6.8 1W (RSSX)
C278 0.033
D251 FMG-24S
D252 FML-22S
D253 FML-32S
D254 FML-22R
D255 FML-22R
D256 FMG-24R
L251 136μH
L252 136μH
L253 2.25mH
L254 68μH
L255
L256
L257
L258
L259 68μH
35V
15.5V
5.7V
-5.7V
-15.5V
-35V
D276 RD5.6ESB2
D277 RD15ESB2
1 -35V
2 -15.5V
3 -5.7V
4
5 FAN STOP
6 GND
7 GND
8 GND
9 GND
10
11 +35V
12 +15.5V
13 +5.7V
14 SUB (5V)
15 POWER CONT
TO DM BOARD DM-19,20,21
1 +15.5V
2 GND
3 -15.5V
TO PA BOARD PA-1
CN252
6 RELAY(-)
5 RELAY(+)
4 GND
3 VCC1
2 VCC2
1 STOP.S
TO M1 BOARD CN202
CN254
3 GND
2 SENSER
1 -12V
CN255
3 GND
2 SENSER
1 -12V
FAN
FAN
C2
CN51-12
CN51-11
CN51-8
CN51-6
CN51-4
IC51 MB3759
VCC DC VDD
GND RT CT D.C
D51 1SS119
D52 1SS119
D53 1SS119
D54 1SS119
D55 11EQS04
D56 11EQS04
D59 1SS119
D57 1SS119
D58 03P2M
Q53 2SA1175
IC251 TL431CLP
IC252 μPC358C
IC253 μPC78-05H
Q251 2SC2785
Q252 2SB882
Q253 2SC2785
Q254 2SB734
Q255 2SC2785
Q256 2SK422
Q257 2SK422
Q258 2SC2785
Q259 2SC2785
Q260 2SC2785
D265 RD39ESB1
D266 RD39ESB1
D267 10E-1
D268 10E-1
D281 AU02A
D282 11EQS04
D283 RD5.1ESB1
D284 RD6.8ESB2
D279 RD6.8ESB2
D278 RD18ESB1
D280 RD12ESB3
PS251 N-15
RV251 1k
TO C1 BOARD CN52
GND 1
SYN 2
CN52

M2 [POWER SUPPLY]

– M2 BOARD –


1
2
3
4
5
6
7
8
A
B
C
D
E
F
Q151
Q152
Q153
Q154
Q155
Q156
T151
T152
T153
T154
T155
L151
DC IN
CN151
PS151
PRIMARY
SECONDRY
M2
SONY
MADE IN JAPAN
IC253
L253
L252
L251
L257
L254
L255
L256
PS251
C2
CN251
CN252
CN254
CN255
FSP
RV251
IC251
IC252
-35V
+35V
GND
-15V
+15V
-15V
+15V
GND
-5.7V
+5.7V
+5V
P.CON

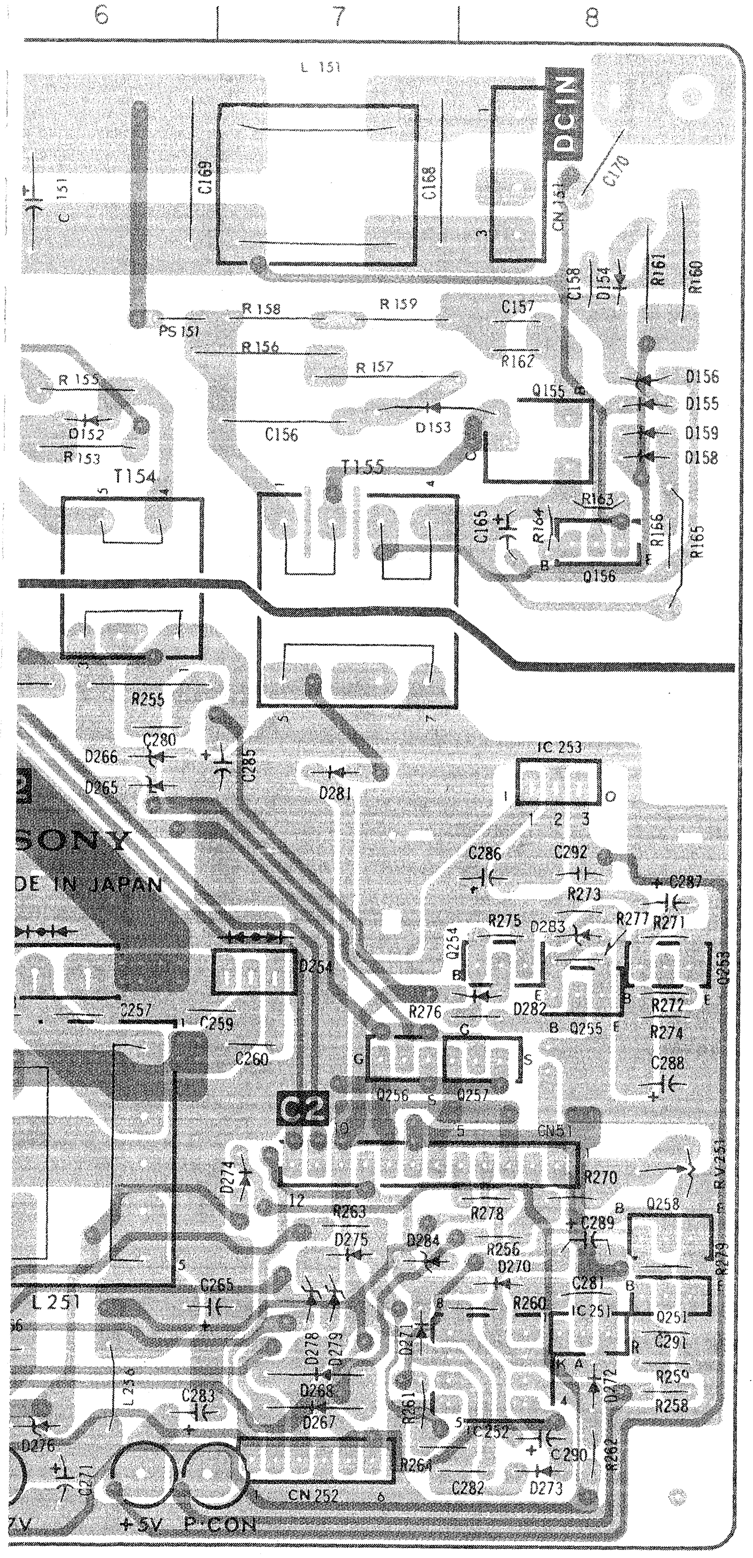
M2 BOARD

IC	
IC251	F - 8
IC252	F - 8
IC253	D - 8

ADJUSTING ELEMENT	
RV251	E - 8

TRANSISTOR	
Q151	A - 2
Q153	A - 3
Q153	B - 5
Q154	B - 6
Q155	B - 6
Q156	C - 8
Q251	F - 8
Q252	E - 3
Q253	D - 8
Q254	D - 8
Q255	D - 8
Q256	E - 7
Q257	E - 8
Q258	E - 8
Q259	F - 1
Q260	F - 1

DIODE	
D151	B - 5
D152	B - 6
D153	B - 7
D154	A - 8
D155	B - 8
D156	B - 8
D158	B - 8
D159	B - 8
D251	D - 2
D252	E - 5
D253	D - 6
D254	D - 7
D255	D - 4
D256	D - 2
D265	D - 6
D266	C - 6
D267	F - 7
D268	F - 7
D270	F - 8
D271	F - 7
D272	F - 8
D273	F - 8
D274	E - 7
D275	F - 7
D276	F - 6
D277	F - 4
D278	F - 7
D279	F - 7
D280	E - 3
D281	D - 7
D282	D - 8
D283	D - 8
D284	F - 7
D285	E - 1
D286	E - 1


6
7
8
L 151
DC IN
C 151
C169
C168
CN 151
C170
C158
D154
R161
R160
R 158
R 159
C157
PS 151
R 156
R 157
R162
R 155
D152
R 153
C156
D153
Q155
D156
D155
D159
D158
T154
T155
C165
R164
R163
R166
Q156
R165
R255
C280
D266
D265
C285
D281
IC 253
SONY
DE IN JAPAN
C286
C292
R273
C287
R275
D283
R277
R271
Q254
D254
Q253
C257
C259
C260
R276
D282
Q255
R272
R274
C288
Q256
Q257
C2
CN51
D274
R263
R278
R270
Q258
RV251
D275
D284
R256
D270
C289
R279
L 251
C265
R260
C281
IC251
Q251
C291
D278
D279
D271
R259
R258
C283
D268
D267
L 36
D276
R261
IC252
D272
C290
R262
C271
CN 252
R264
C282
D273
7V
+5V
P.CON

M2 BOARD

IC	
IC251	F - 8
IC252	F - 8
IC253	D - 8

ADJUSTING ELEMENT	
RV251	E - 8

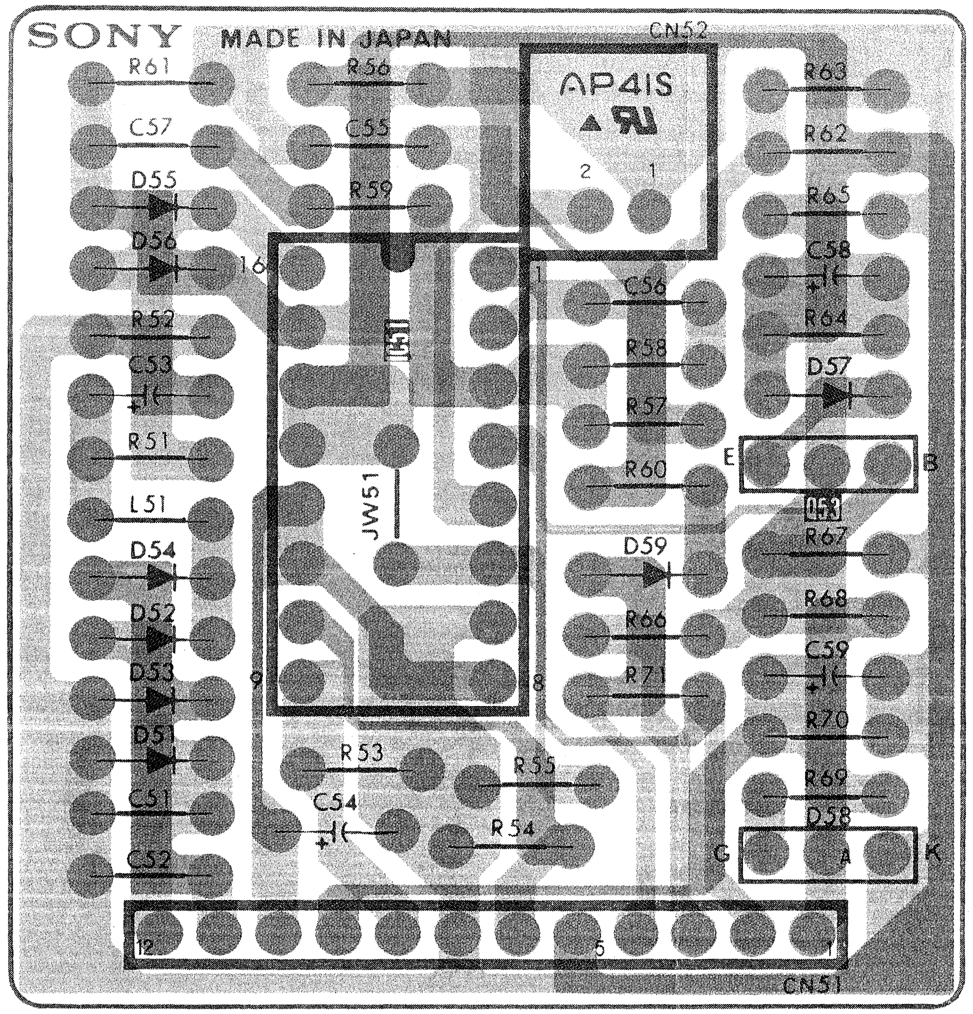
TRANSISTOR	
Q151	A - 2
Q153	A - 3
Q153	B - 5
Q154	B - 6
Q155	B - 6
Q156	C - 8
Q251	F - 8
Q252	E - 3
Q253	D - 8
Q254	D - 8
Q255	D - 8
Q256	E - 7
Q257	E - 8
Q258	E - 8
Q259	F - 1
Q260	F - 1

DIODE	
D151	B - 5
D152	B - 6
D153	B - 7
D154	A - 8
D155	B - 8
D156	B - 8
D158	B - 8
D159	B - 8
D251	D - 2
D252	E - 5
D253	D - 6
D254	D - 7
D255	D - 4
D256	D - 2
D265	D - 6
D266	C - 6
D267	F - 7
D268	F - 7
D270	F - 8
D271	F - 7
D272	F - 8
D273	F - 8
D274	E - 7
D275	F - 7
D276	F - 6
D277	F - 4
D278	F - 7
D279	F - 7
D280	E - 3
D281	D - 7
D282	D - 8
D283	D - 8
D284	F - 7
D285	E - 1
D286	E - 1

C2

[POWER SUPPLY]

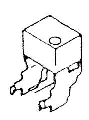
– C2 BOARD –


SONY
MADE IN JAPAN
CN52
R61
R56
AP4IS
R63
C57
C55
2
1
R62
D55
R59
R65
D56
16
1
C58
C56
R52
IC51
R58
R64
D57
C53
R57
R51
JW51
R60
E
B
L51
Q51
R67
D54
D59
R68
D52
R66
R71
C59
D53
9
8
R70
D51
R53
R55
R69
C54
D58
C51
R54
G
A
K
C52
12
5
1
CN51

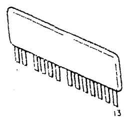
- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.

7-5. SEMICONDUCTORS

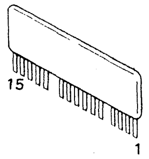
BX1398



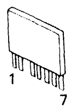
BX-6473



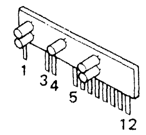
BX-6474



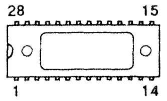
BX-6475



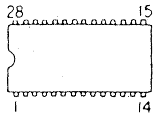
BX7913



CXA1158P

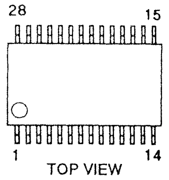


CXA1216P
MBM27C512P-20
TDA4555/V1



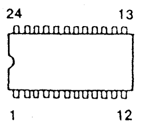
(TOP VIEW)

CXK3864-040M
CXK3864-041M
CXK3864-042M



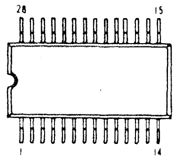
TOP VIEW

CXK5814P-45L



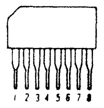
(TOP VIEW)

CXK5864BM-12L

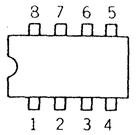


(TOP VIEW)

CX23065A
LA7016

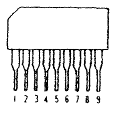


CX7916
LM393P
LM6364N
TL082CP
μPC358C
μPC4558C
μ PC814C

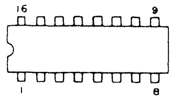


(TOP VIEW)

CX-894

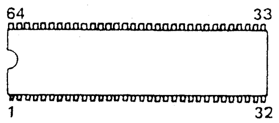


HD10124
HD14053BFP
HD14538BFP
HD14538BP
HD74HC123P
MB3759
MB3759P -SNY
MB675429
MC10124L
MC14040BCP
MC14495P1
MC14572UBCP
MC34051P
MC74HC4053N
MC74HC4538AN
MC74HC4538N
SN74S124N
TC4040BP



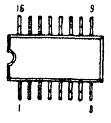
(TOP VIEW)

HD64180R1P8



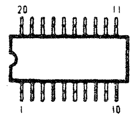
(TOP VIEW)

HD74HC138FP
MC14053BF
MC74HC157AF
SN74HC138ANS
TC74HC123F
SN74HC157ANS
SN74HCT137NS



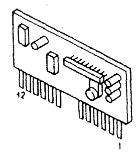
(TOP VIEW)

HD74HC244FP
HD74HC255FP
MC74HC541F



(TOP VIEW)

H8B7178B



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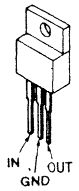
μPC7805HF



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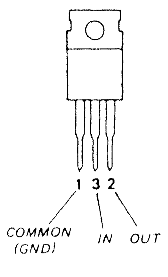
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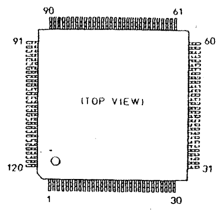
COMMON
(GND)
IN
OUT

MB605195


90
61
91
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(TOP VIEW)
120
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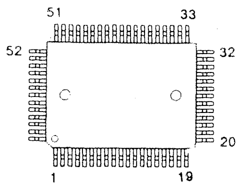
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19

(TOP VIEW)

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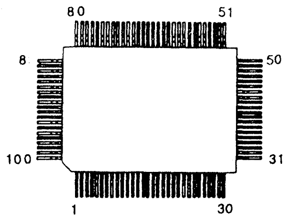
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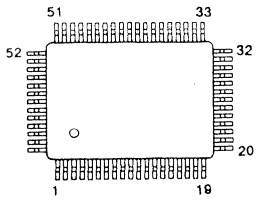
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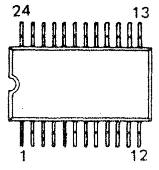
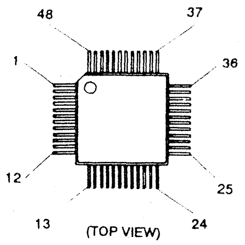
(TOP VIEW)

MB86023

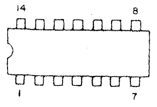


(TOP VIEW)

MB8855-1314N


48
37
1
36
12
25
13
(TOP VIEW)
24

MC1495L
MC74HC00AN
MC74HC132AN
SN74HC132AN
μPC1394C



(TOP VIEW)

MC74F00M
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MC74HC126AF
MC74HC14AF
SN74HC04ANS
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SN74HC126ANS
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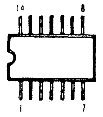
SN74LS12NS



(TOP VIEW)

MC74HC244AN
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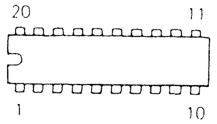
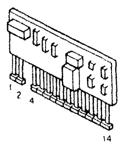


(TOP VIEW)

MC-8638



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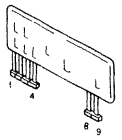
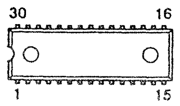


M50461-157SP



TOP VIEW

NJM2228M
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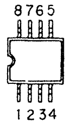
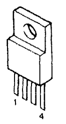
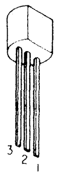


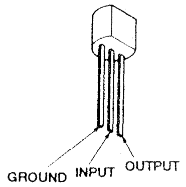
PQ05RF1



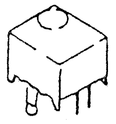
RC78L05A



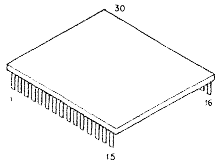
RC79L12A


GROUND
INPUT
OUTPUT

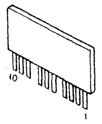
SBX1483-59



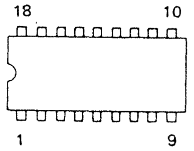
SBX1692-01



SNY-9202

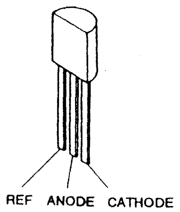


TDA4565



(TOP VIEW)

TL431CLP
TL431CLPB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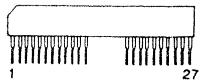
TY885002A



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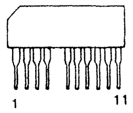

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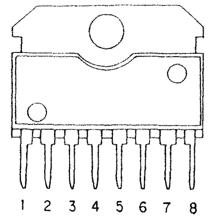

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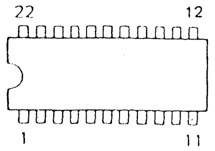
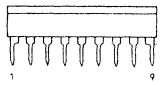


(Top view)

μPC1406HA



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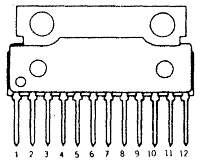
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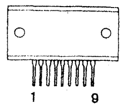
MARKING SIDE VIEW

VPH06



DTC144EK
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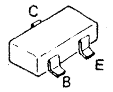

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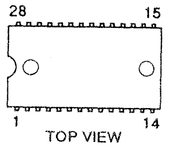
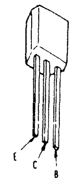
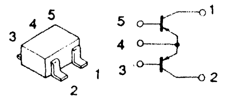


TOP VIEW

DTC144ES
XDA144ES
XDC114ES



FMS1
FMS2


4 5
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1
2
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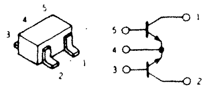
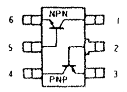
4
3
1
2

FMW-8
FMW1
FMW2



IMX2


6
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PNP
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2SA1407-D
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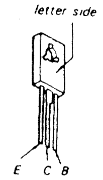
2SD882-Q


letter side
E C B

2SA1175
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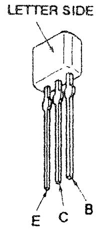
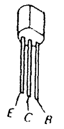
2SC2785
2SC2785-HFE


LETTER SIDE
E C B

2SA1208-S
2SC2910
2SD789-4
2SD789-34



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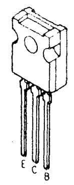

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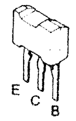

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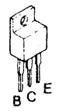
2SD1977



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2SB734-34
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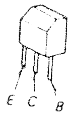
2SD774-34



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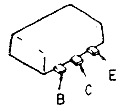

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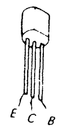

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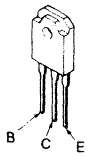

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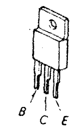

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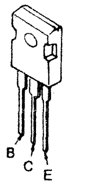
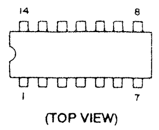
2SC3998C



MC1495L
MC74HC00AN
MC74HC132AN
SN74HC132AN
μPC1394C


14
8
1
7
(TOP VIEW)

MC74F00M
MC74HC00AF
MC74HC126AF
MC74HC14AF
SN74HC04ANS
SN74HC107NS
SN74HC126ANS
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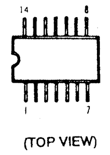
14
8
1
7
(TOP VIEW)

MC74HC244AN
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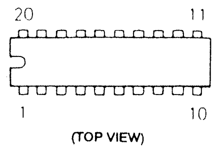
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11
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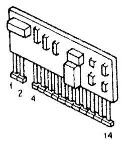
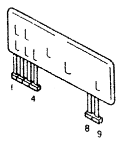
(TOP VIEW)

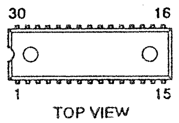
MC-8638



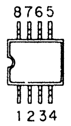
MC-8639



M50461-157SP


30
16
1
15
TOP VIEW

NJM2228M
μPC393G2
μPC4558G2
μPC814G2-1



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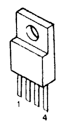
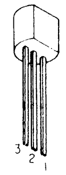
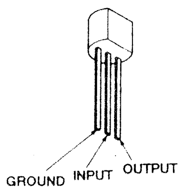


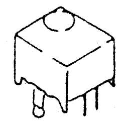
RC78L05A



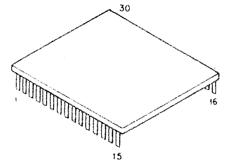
RC79L12A


GROUND
INPUT
OUTPUT

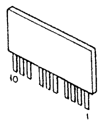
SBX1483-59



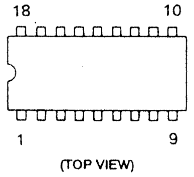
SBX1692-01



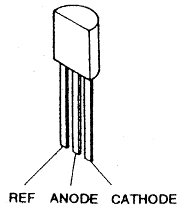
SNY-9202



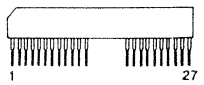
TDA4565


18
10
1
9
(TOP VIEW)

TL431CLP
TL431CLPB


REF
ANODE
CATHODE

TY885002A



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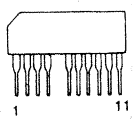

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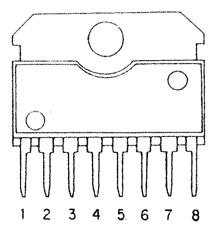
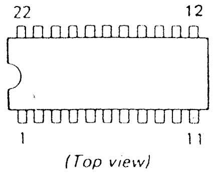
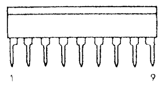


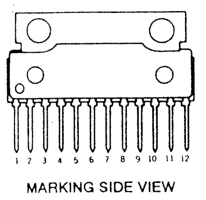
μPC1377C


22
12
1
11
(Top view)

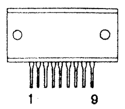
μPC1406HA



μPC1498H


1 2 3 4 5 6 7 8 9 10 11 12
MARKING SIDE VIEW

VPH06



DTC144EK
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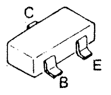
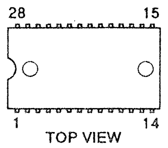
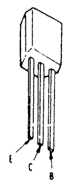
2SA1462-Y33
2SA812
2SC1623-L6
2SC2712-YG
2SC3545



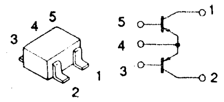
X28C64PI


28
15
1
14
TOP VIEW

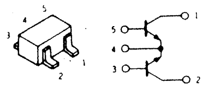
DTC144ES
XDA144ES
XDC114ES



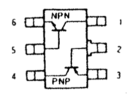
FMS1
FMS2



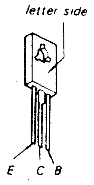
FMW-8
FMW1
FMW2



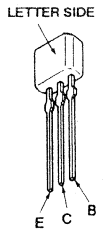
IMX2



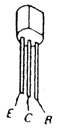
2SA1142-P
2SA1381-E
2SA1407-D
2SC2688
2SC2688-LK
2SD882-Q


letter side
E
C
B

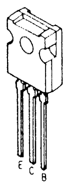
2SA1175
2SA1175-HFE
2SC2785
2SC2785-HFE


LETTER SIDE
E
C
B

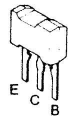
2SA1208-S
2SC2910
2SD789-4
2SD789-34



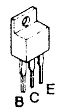
2SA1358-Y
2SC3421-Y



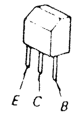
2SA1428-O
2SC1428-Y
2SC3668-O



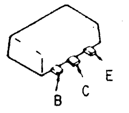
2SB1315
2SD1977



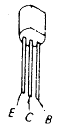
2SB733-3
2SB733-4
2SB734-34
2SC3209LK
2SD774-34



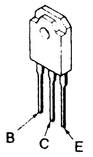
2SB798-DL



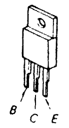
2SC2551-O



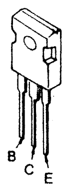
2SC2555-1
2SC2555-2



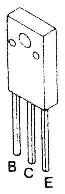
2SC3150
2SC3675
2SD982



2SC3998
2SC3998CA



2SC4054N



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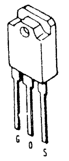
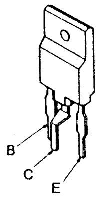


2SD1887-CA



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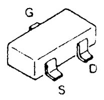
2SK160-K6



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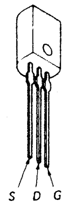
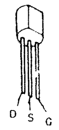
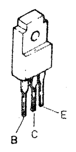


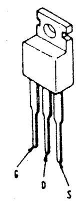
2SK523-M1



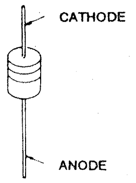
2SK755



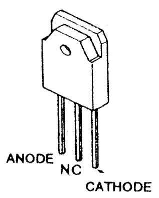
2SJ143
2SK817
2SK929



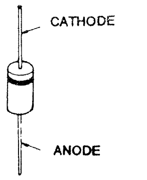
AU02A
RD10ES-B2
RD12ES-B2
RD12ES-B3
RD13ES-B2
RD15ES-B2
RD18ES-B1
RD2.0ES-B2
RD2.4ES-B1
RD20ES-B2
RD3.3ES-B1
RD3.3ES-B2
RD39ES-B
RD39ES-B2
RD5.1ES-B1
RD5.1ES-B2
RD5.6ES-B2
RD6.8ES-B2
11EQS04
1SS119
1SS120


CATHODE
ANODE

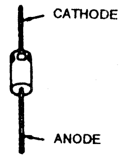
DD50R


ANODE
NC
CATHODE

EGP10D
EGP10G
ERB43-08
ERC38-06
10E1
1SS83


CATHODE
ANODE

ERA22-06
ERA22-08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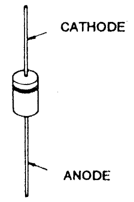
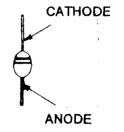
ANODE

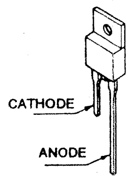
ERC06-15S
ERC91-02
RU-1
RU-1C


CATHODE
ANODE

ERC06-15SA
V06C
V09C
V09G
V11N
V19EF1


CATHODE
ANODE

ERC88-009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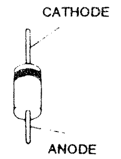
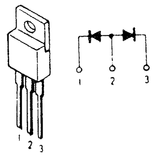
ANODE

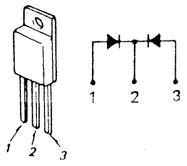
ERD29-08J
ERD33-02


CATHODE
ANODE

FMG-24R
FML-22R



FMG-24S
FML-22S



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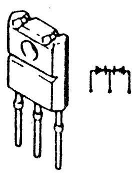
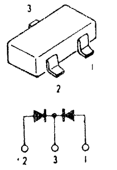
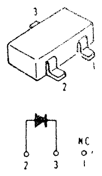
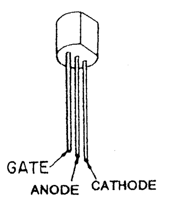


MA152WK
1S2837

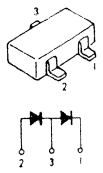


RD12M-B2
RD13M-B2
RD3.3M-B2
RD3.6M-B1
RD4.3M-B1
RD5.1M-B2
RD6.2M-B1
1SS220

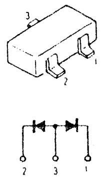



GATE
ANODE
CATHODE

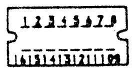
1SS123
1SS226



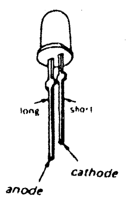
1S2835
1S2836



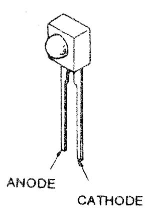
GL-6R202


BOTTOM VIEW

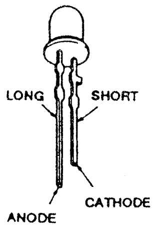
PY5504S-1


long
short
anode
cathode

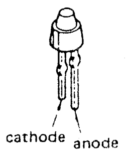
TLR214


ANODE
CATHODE

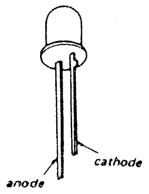
SLH-34MC3


LONG
SHORT
ANODE
CATHODE

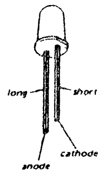
SLP144B


cathode
anode

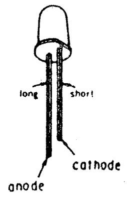
SLR-54VC12


anode
cathode

TLG113A


long
short
anode
cathode

TLR113A


long
short
anode
cathode

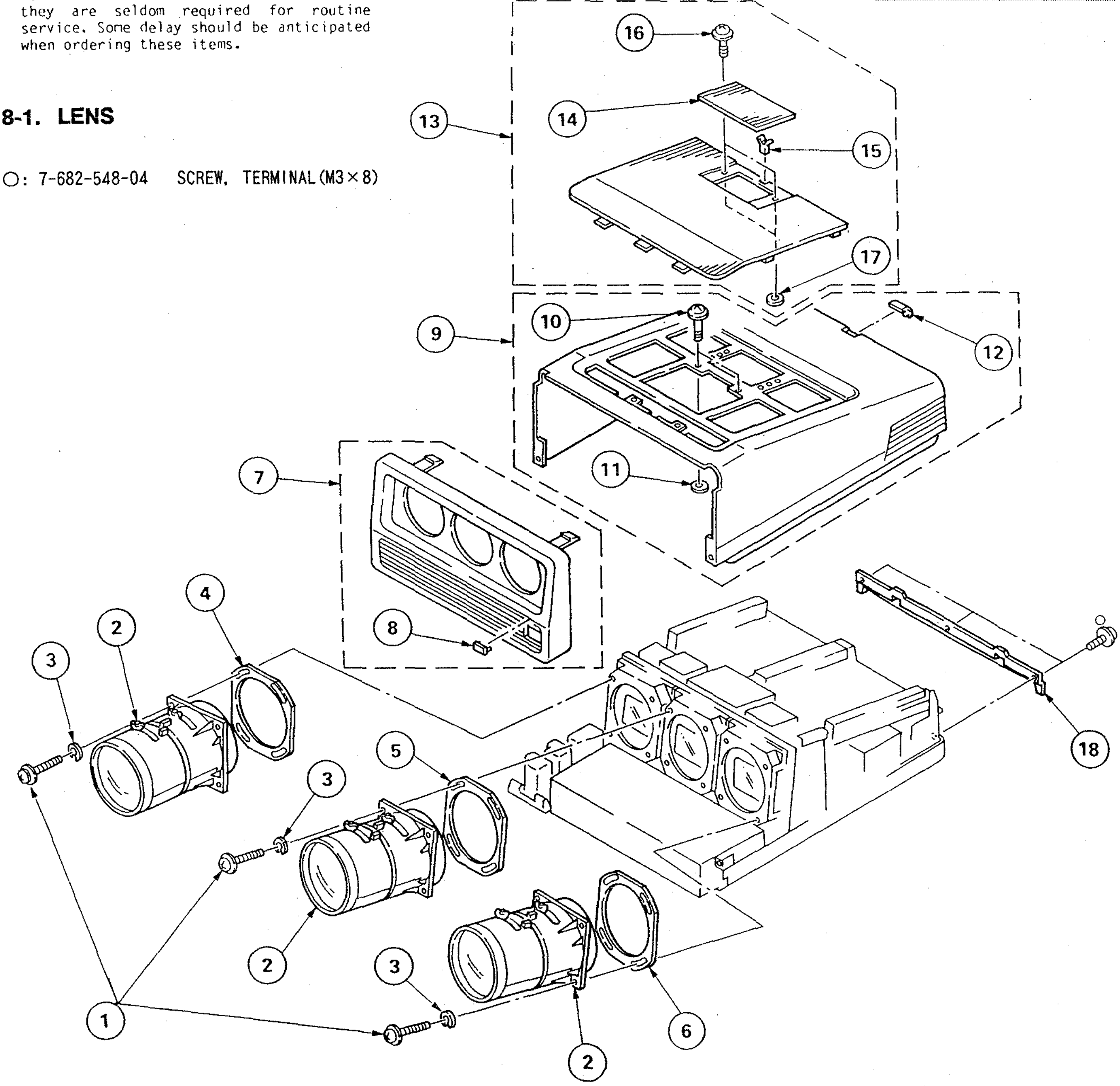
SECTION 8
EXPLODED VIEWS

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

8-1. LENS

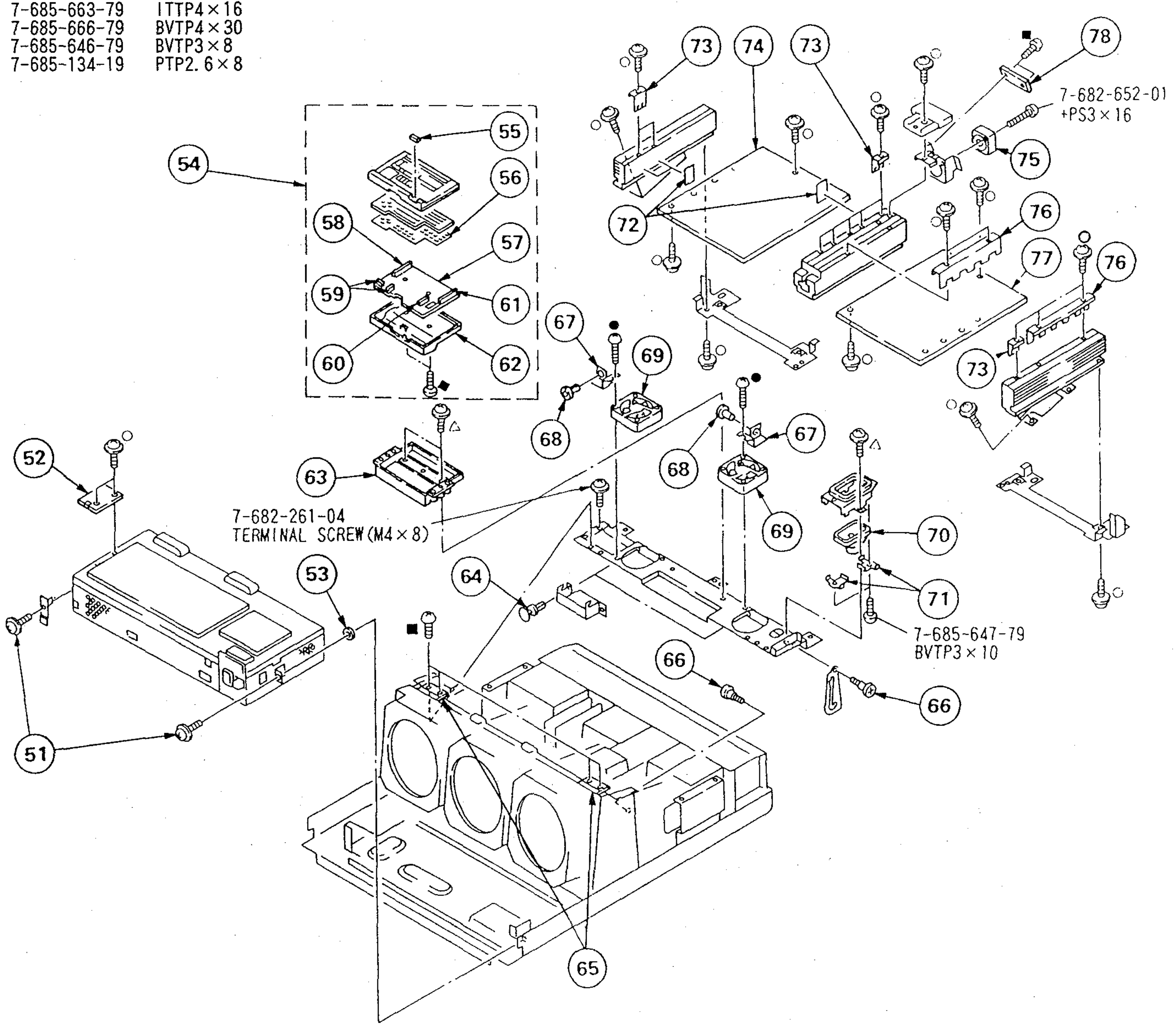
○: 7-682-548-04 SCREW, TERMINAL(M3×8)



REF.NO.	PART NO.	DESCRIPTION	REMARK
1	4-034-126-01	SCREW (C)	
2	4-034-141-01	LENS (PT-65)	
3	4-034-117-01	WASHER, SUPPORT	
4	4-034-143-01	SPACER (B), LENS	
5	4-034-144-01	SPACER (G), LENS	
6	4-034-142-01	SPACER (R), LENS	
7	X-4395-512-1	PANEL ASS'Y, FRONT	8
8	4-395-534-02	FILTER	
9	X-4030-078-1	HOOD ASS'Y	10-12
10	4-033-711-01	SCREW (+PWH M4X20), PREVENTION	
11	4-033-712-01	WASHER	
12	4-395-536-01	PLATE, INDICATE	
13	X-4395-511-3	PLATE ASS'Y, TOP	14-17
14	4-395-596-01	DOOR, CONTROL PANEL	
15	4-392-036-01	CATCHER, PUSH	
16	4-033-713-01	SCREW (+PWH M4X10), PREVENTION	
17	4-033-712-01	WASHER	
18	4-395-595-01	HOLDER, CONNECTOR PANEL	

8-2. ED BLOCK

○: 7-682-548-04 SCREW, TERMINAL(M3×8)
△: 7-685-663-79 ITTP4×16
●: 7-685-666-79 BVTP4×30
■: 7-685-646-79 BVTP3×8
◆: 7-685-134-19 PTP2.6×8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7-682-652-01
+PS3×16
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7-682-261-04
TERMINAL SCREW(M4×8)
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7-685-647-79
BVTP3×10
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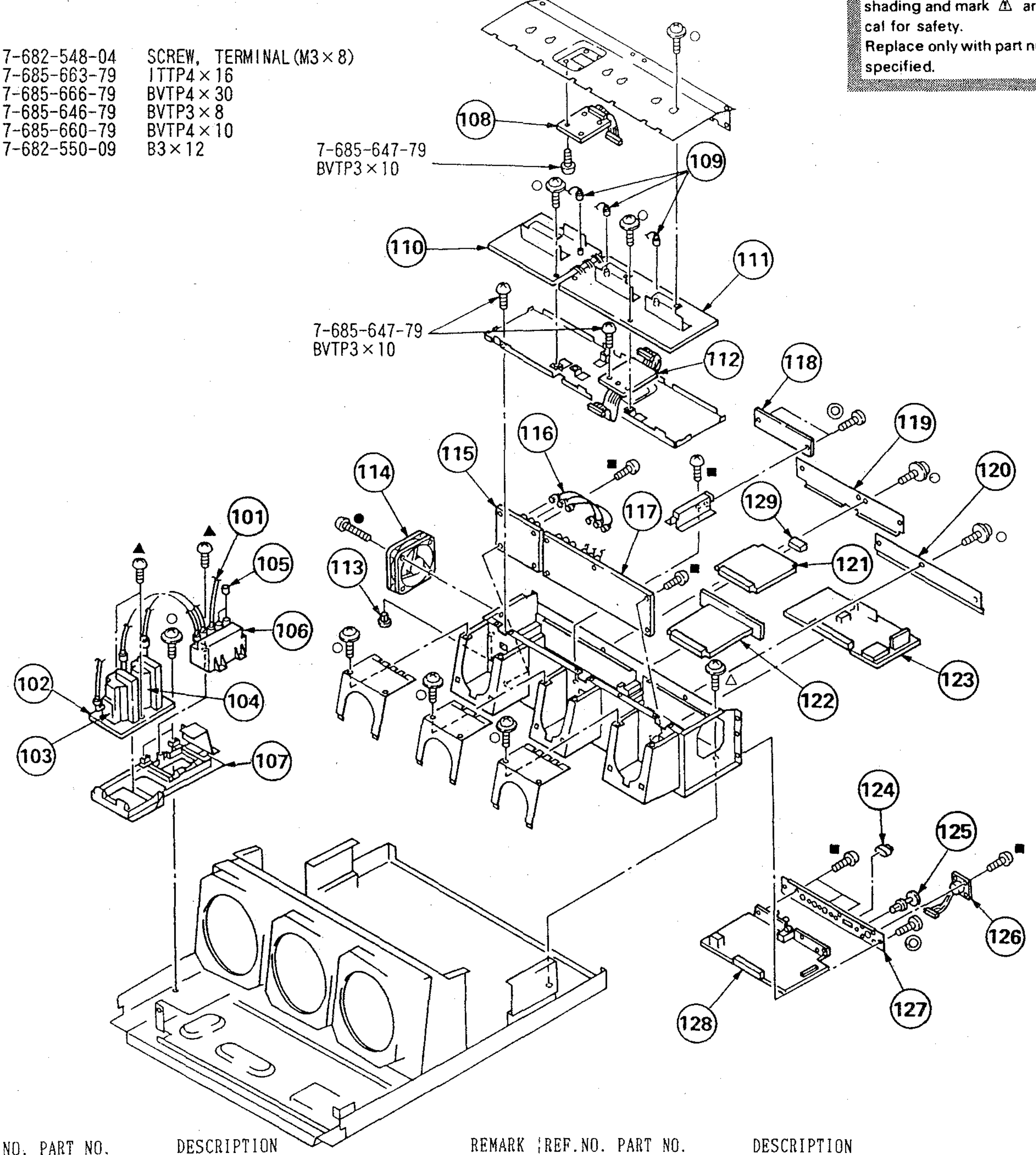
REF.NO.	PART NO.	DESCRIPTION	REMARK
51	4-033-713-01	SCREW (+PWH M4X10), PREVENTION	
52	*4-034-125-01	STOPPER (B), PLATE	
53	4-033-712-01	WASHER	
54	A-1499-936-A	PANEL ASS'Y, CONTROL	55-62
55	4-395-501-01	KEY TOP	
56	4-395-509-01	SHEET, RUBBER	
57	*1-631-359-11	RC BOARD	58-61
58	*1-631-356-11	RCA BOARD	
59	*1-631-493-11	RCD BOARD	
60	*1-631-358-11	RCC BOARD	
61	*1-631-357-11	RCB BOARD	
62	4-395-508-01	CASE, LOWER	
63	*4-395-584-02	HOLDER, CONTROL PANEL	
64	4-374-303-01	RIVET, NYLON	
65	*3-658-816-00	HINGE, FRONT	
66	3-671-135-00	SCREW, STEP	
67	*4-034-124-01	BRACKET (A), SENSOR	
68	*4-034-118-01	HOLDER (A), SENSOR	
69	1-541-923-31	FAN, DC	
70	1-503-255-00	SPEAKER	
71	4-383-026-01	SPRING	
72	4-393-406-01	SHEET (R), RADIATION	
73	*4-395-528-01	HOLDER (C), TR	
74	*A-1346-005-A	E BOARD, COMPLETE	
75	1-541-950-11	DC FAN	
76	*4-395-553-01	HOLDER (A), TR	
77	*A-1346-004-A	DC BOARD, COMPLETE	
78	*1-639-942-11	NA BOARD	

8-3. C SHIELD BLOCK

○ : 7-682-548-04 SCREW, TERMINAL (M3×8)
△ : 7-685-663-79 ITTP4×16
● : 7-685-666-79 BVTP4×30
■ : 7-685-646-79 BVTP3×8
▲ : 7-685-660-79 BVTP4×10
◎ : 7-682-550-09 B3×12

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.


7-685-647-79
BVTP3×10
7-685-647-79
BVTP3×10
101
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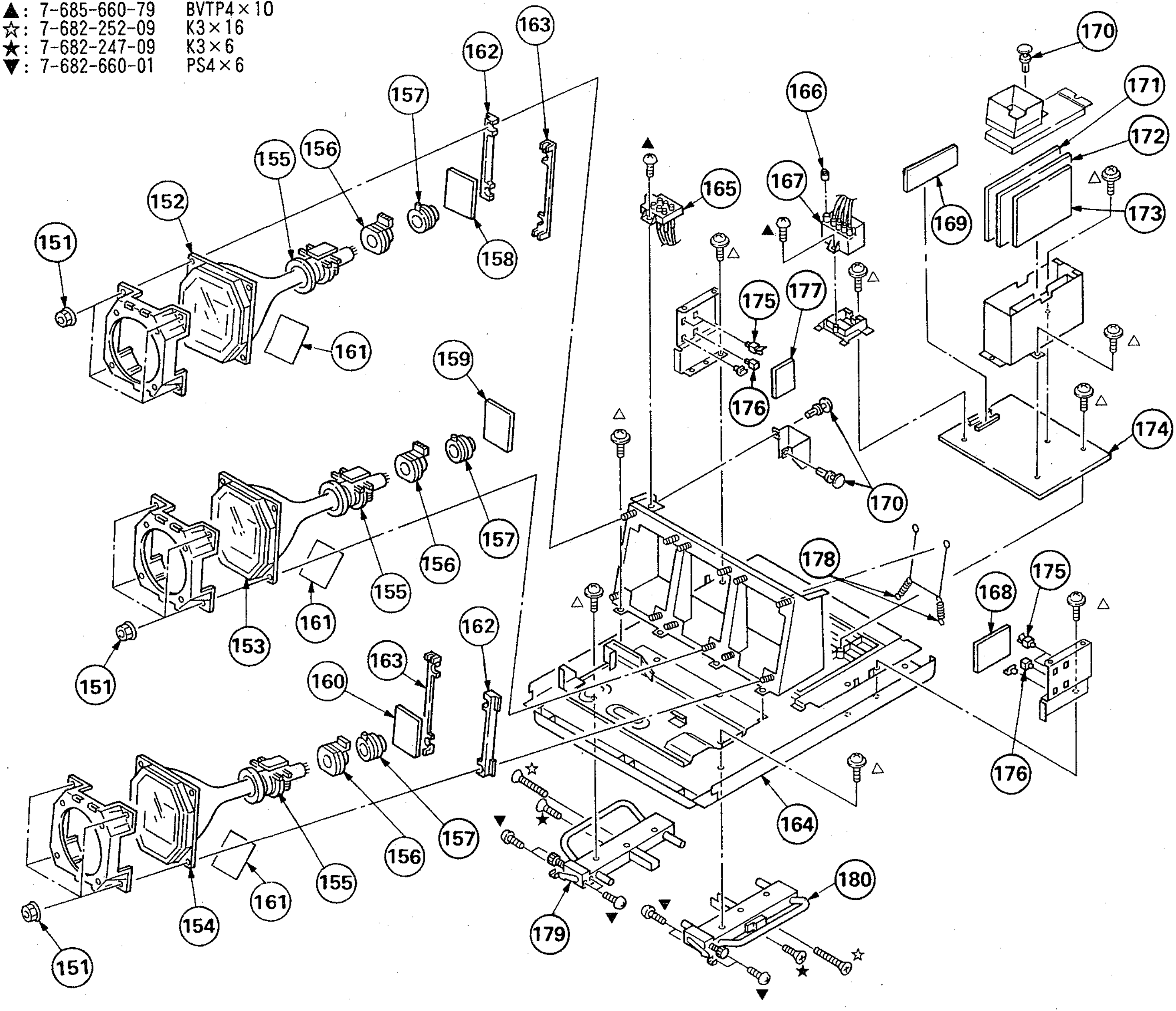
REF.NO.	PART NO.	DESCRIPTION	REMARK
101 ⚠	1-559-865-31	LEAD ASS'Y, HIGH-VOLTAGE	
102	*1-639-938-11	PB BOARD	
103 ⚠	1-439-466-12	TRANSFORMER ASS'Y, FLYBACK (NX-2500)	
104 ⚠	1-439-466-21	TRANSFORMER ASS'Y, FLYBACK (NX-2502)	
105	4-373-137-01	CAP (Z), RUBBER	
106 ⚠	1-453-108-31	DC BLOCK, HIGH-VOLTAGE	
107	*4-395-514-01	BRACKET, HV	
108	*1-639-929-11	CFB BOARD	
109	*1-555-110-00	CABLE, P-P	
110	*A-1335-033-A	CA (B) BOARD, COMPLETE	
111	*A-1335-032-A	CA (RG) BOARD, COMPLETE	
112	*1-639-928-11	CFA BOARD	
113	*4-034-118-01	HOLDER (A), SENSOR	
114	1-541-950-11	FAN, DC	
115	*1-639-927-11	QM BOARD	
116	*1-575-091-11	CABLE, P-P	
117	*1-639-926-11	BM BOARD	
118	*4-395-530-01	PLATE (Q)	
119	*4-395-558-01	PLATE (Z)	
120	*4-395-559-01	PLATE (B)	
121	*A-1130-978-A	BC BOARD, COMPLETE	
122	1-466-674-11	INTERFACE UNIT (IFB-11)	
123	*A-1135-692-A	BA BOARD, COMPLETE	
124	*3-673-948-11	CAP, DUST	
125	4-374-303-01	RIVET, NYLON	
126	1-575-092-11	CONNECTOR ASS'Y, MULTI 14P	
127	4-395-583-01	PANEL (B), CONNECTOR	
128	*A-1135-693-A	BB BOARD, COMPLETE	
129	4-353-708-00	HOOK, FINGER	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

8-4. BASE1

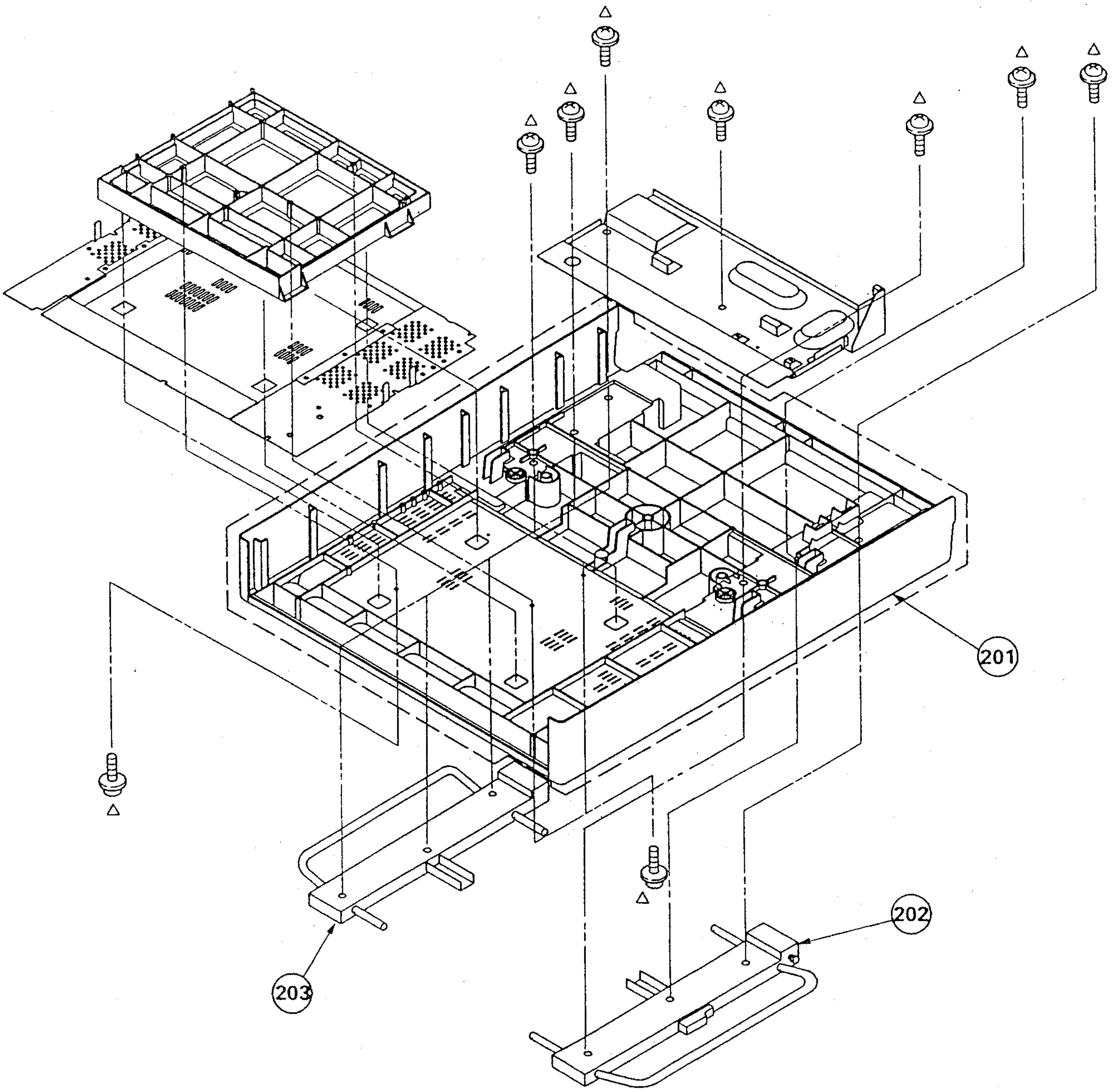
△: 7-685-663-79 ITTP4×16
▲: 7-685-660-79 BVTP4×10
☆: 7-682-252-09 K3×16
★: 7-682-247-09 K3×6
▼: 7-682-660-01 PS4×6



REF.NO.	PART NO.	DESCRIPTION	REMARK
151	4-304-511-00	NUT, FLANGE	
152	⚠.8-736-222-05	PICTURE TUBE 07MP B	
153	⚠.8-736-221-05	PICTURE TUBE 07MP G	
154	⚠.8-736-223-05	PICTURE TUBE 07MP R	
155	⚠.1-451-355-11	DEFLECTION YOKE (Y636PJ)	
156	⚠.1-452-487-31	NECK ASS'Y, PICTURE TUBE (NA363A)	
157	⚠.1-452-429-21	NECK ASS'Y, PICTURE TUBE (NA366)	
158	*1-639-948-11	CBB BOARD	
159	*1-639-947-11	CBG BOARD	
160	*1-639-946-11	CBR BOARD	
161	4-396-282-01	SHEET (C), ABSORPTION	
162	*4-395-560-01	SPACER (120S), PICTURE TUBE	
163	*4-395-561-01	SPACER (120U), PICTURE TUBE	
164	4-395-588-03	BASE	
165	⚠.1-238-755-11	RESISTOR ASS'Y, HIGH-VOLTAGE	
166	4-373-137-01	CAP (Z), RUBBER	
167	⚠.1-453-108-11	DC BLOCK, HIGH-VOLTAGE	
168	*1-639-931-11	L BOARD	
169	*1-641-601-11	DF BOARD	
170	4-374-303-01	RIVET, NYLON	
171	*A-1346-003-A	DB BOARD, COMPLETE	
172	*A-1346-002-A	DA BOARD, COMPLETE	
173	*A-1394-325-A	Y BOARD, COMPLETE	
174	*1-641-634-11	DM BOARD	
175	*3-701-903-00	HOLDER, PC BOARD	
176	*3-703-141-00	HOLDER, PCB	
177	*1-639-941-11	KA BOARD	
178	4-303-774-XX	SPRING	
179	X-4395-510-1	HANDLE (LEFT) ASS'Y	
180	X-4395-509-1	HANDLE (RIGHT) ASS'Y	

BASE2

△: 7-685-663-79 ITTP4×16

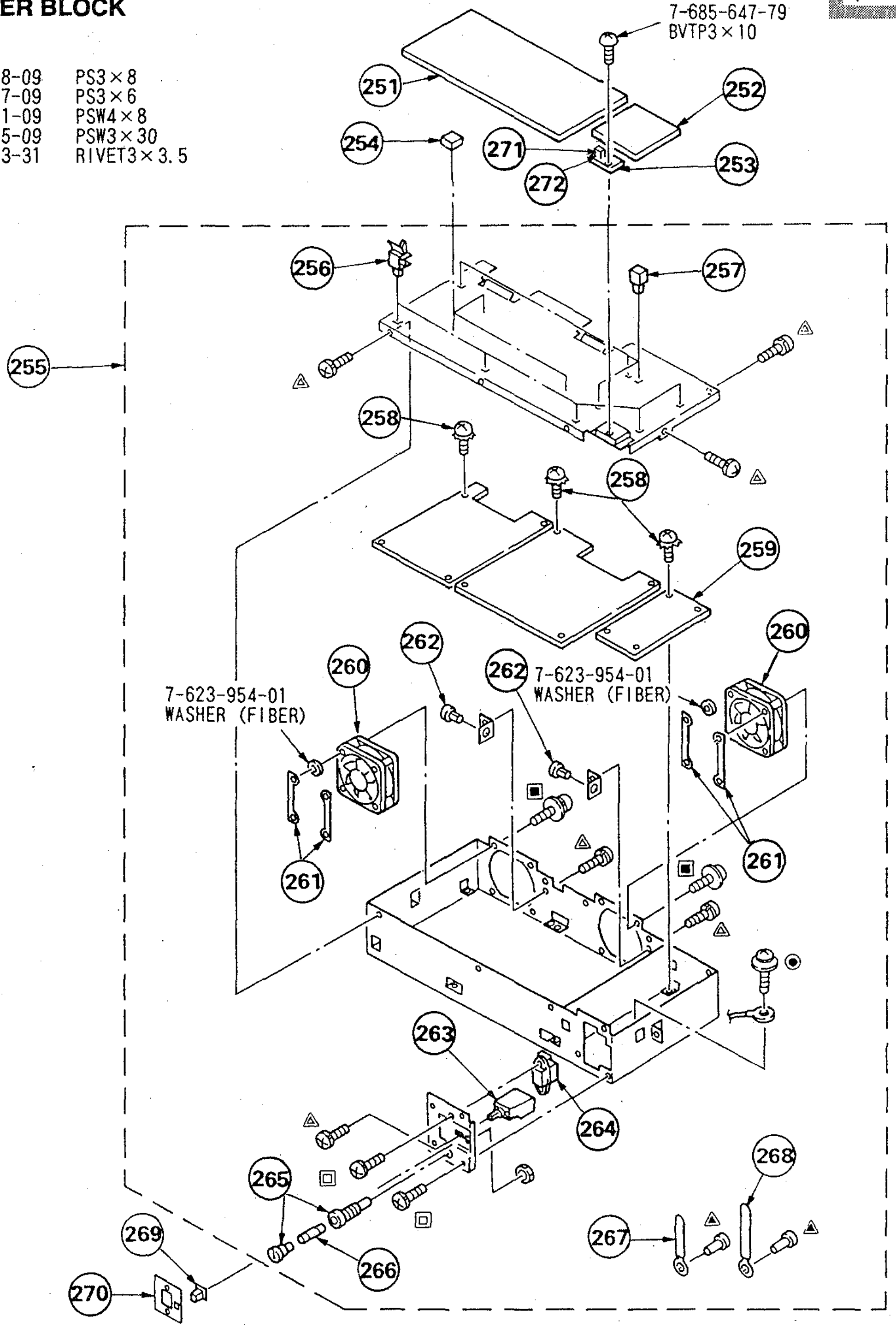


REF.NO.	PART NO.	DESCRIPTION	REMARK
201	4-395-588-03	BASE	
202	X-4395-510-1	HANDLE (LEFT) ASS'Y	
203	X-4395-509-1	HANDLE (RIGHT) ASS'Y	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

8-5. POWER BLOCK

▣ : 7-682-648-09 PS3×8
⚠ : 7-682-647-09 PS3×6
◉ : 7-682-661-09 PSW4×8
■ : 7-682-655-09 PSW3×30
▲ : 7-625-723-31 RIVET3×3.5


7-685-647-79
BVTP3×10
251
252
254
271
272
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262
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262
260
7-623-954-01
WASHER (FIBER)
7-623-954-01
WASHER (FIBER)
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REF.NO.	PART NO.	DESCRIPTION	REMARK
251	*A-1195-044-A	PA BOARD, COMPLETE	
252	*A-1380-373-A	K BOARD, COMPLETE	
253	*1-639-943-11	NB BOARD	
254	*4-398-732-01	CUSHION	
255	⚠.1-413-700-11	SWITCHING REGULATOR (SOPS-1037)	
256	*3-703-141-00	HOLDER, PCB	
257	*3-701-903-00	HOLDER, PC BOARD	
258	2-430-772-00	SCREW, M3X8	
259	⚠.1-236-604-12	FILTER BLOCK, NOISE (M3B BOARD)	
260	1-541-923-31	FAN, DC	
261	*2-434-408-01	BRACKET (CCR-45), BRACKET FAN	
262	*4-034-118-01	HOLDER (A), SENSOR	
263	⚠.1-572-067-21	SWITCH, PUSH (1 KEY)(AC POBWR)	
264	⚠.1-580-375-11	INLET 3P	
265	1-533-224-11	HOLDER, FUSE (DIA. 5.2)	
266	⚠.1-532-325-11	FUSE, TIME-LAG (6.3A/250V)	
267	*3-701-822-00	HOLDER, WIRE	
268	*4-908-882-01	CLAMP	
269	4-362-811-00	BUTTON, MAIN POWER	
270	4-396-205-01	PLATE, POWER	
271	*4-374-987-01	GUIDE, LIGHT	
272	*4-381-686-01	BRACKET (B), BAR, OPTICAL	

SECTION 9
ELECTRICAL PARTS LIST

BM **BC**

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

- The components identified by ⧓ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
- ※ : Selected to yield optimum performance.
- There are some cases the reference number on one board overlaps on the other board. Therefore, when ordering parts by the reference number, please include the board name.

REF.NO.	PART NO.	DESCRIPTION	REMARK
	*1-639-926-11	BM BOARD ********	
	*1-564-508-11	PLUG, CONNECTOR 5P	
	*1-564-509-11	PLUG, CONNECTOR 6P	
	*1-564-515-11	PLUG, CONNECTOR 12P	
	*1-568-979-11	CONNECTOR 30P	
	*1-568-981-11	CONNECTOR, MALE 64P	
	*1-568-982-11	CONNECTOR, FEMALE 96P	
	*1-568-984-11	CONNECTOR, MALE 96P	
	*1-568-985-11	CONNECTOR, FEMALE 64P	

<JACK>

J1	*1-526-575-00	SOCKET, PLUG 1P
J2	*1-526-575-00	SOCKET, PLUG 1P
J3	*1-526-575-00	SOCKET, PLUG 1P
J4	*1-526-575-00	SOCKET, PLUG 1P
J5	*1-526-575-00	SOCKET, PLUG 1P
J6	*1-526-575-00	SOCKET, PLUG 1P

****

	*A-1130-978-A	BC BOARD, COMPLETE ******************
	*1-568-981-11	CONNECTOR, MALE 64P

<CAPACITOR>

C101	1-101-004-00	CERAMIC	0.01MF		50V
C102	1-101-004-00	CERAMIC	0.01MF		50V
C103	1-101-004-00	CERAMIC	0.01MF		50V
C104	1-101-004-00	CERAMIC	0.01MF		50V
C105	1-124-927-11	ELECT	4.7MF	20%	50V
C106	1-124-927-11	ELECT	4.7MF	20%	50V
C107	1-124-927-11	ELECT	4.7MF	20%	50V
C108	1-124-927-11	ELECT	4.7MF	20%	50V
C109	1-126-101-11	ELECT	100MF	20%	16V
C110	1-124-907-11	ELECT	10MF	20%	50V
C111	1-101-004-00	CERAMIC	0.01MF		50V

<DIODE>

D101	8-719-911-19	DIODE 1SS119
D102	8-719-911-19	DIODE 1SS119
D103	8-719-911-19	DIODE 1SS119
D104	8-719-911-19	DIODE 1SS119
D105	8-719-911-19	DIODE 1SS119
D106	8-719-911-19	DIODE 1SS119
D107	8-719-900-95	DIODE V09G

REF.NO.	PART NO.	DESCRIPTION	REMARK

<IC>

IC101	8-759-007-21	IC MC74HC4053N
IC102	8-759-001-00	IC MC74HC132N
IC103	8-759-001-00	IC MC74HC132N
IC104	8-759-239-47	IC TC74HC123AP
IC105	8-759-929-62	IC LM7812CT

<COIL>

L101	1-459-155-00	COIL (WITH CORE) 45UH

<TRANSISTOR>

Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q102	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q103	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q104	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q105	8-729-119-78	TRANSISTOR 2SC2785-HFE

<RESISTOR>

R101	1-249-405-11	CARBON	100	5%	1/4W
R102	1-249-405-11	CARBON	100	5%	1/4W
R103	1-249-437-11	CARBON	47K	5%	1/4W
R104	1-249-437-11	CARBON	47K	5%	1/4W
R105	1-249-437-11	CARBON	47K	5%	1/4W
R106	1-249-429-11	CARBON	10K	5%	1/4W
R107	1-249-421-11	CARBON	2.2K	5%	1/4W
R108	1-249-429-11	CARBON	10K	5%	1/4W
R109	1-249-429-11	CARBON	10K	5%	1/4W
R110	1-249-429-11	CARBON	10K	5%	1/4W
R111	1-249-437-11	CARBON	47K	5%	1/4W
R112	1-249-405-11	CARBON	100	5%	1/4W
R113	1-249-424-11	CARBON	3.9K	5%	1/4W
R114	1-249-405-11	CARBON	100	5%	1/4W
R115	1-249-437-11	CARBON	47K	5%	1/4W
R116	1-249-424-11	CARBON	3.9K	5%	1/4W
R117	1-249-429-11	CARBON	10K	5%	1/4W
R118	1-249-435-11	CARBON	33K	5%	1/4W
R119	1-249-435-11	CARBON	33K	5%	1/4W
R120	1-249-421-11	CARBON	2.2K	5%	1/4W
R121	1-249-429-11	CARBON	10K	5%	1/4W
R122	1-249-429-11	CARBON	10K	5%	1/4W

<RELAY>

RY101	1-515-757-11	RELAY
RY102	1-515-757-11	RELAY
RY103	1-515-757-11	RELAY

****

BA

REF.NO.	PART NO.	DESCRIPTION			REMARK
	*A-1135-692-A	BA BOARD, COMPLETE ******************			
	*1-568-984-11	CONNECTOR, MALE 96P			
	1-570-859-11	SWITCH, SLIDE			
	4-382-854-11	SCREW (M3X10), P, SW (+)			
		<MODULE>			
BPF1	1-236-366-11	MODULE, TRAP			
BPF2	1-236-365-11	MODULE, TRAP			
		<CAPACITOR>			
C1	1-124-910-11	ELECT	47MF	20%	50V
C2	1-124-910-11	ELECT	47MF	20%	50V
C3	1-124-910-11	ELECT	47MF	20%	50V
C7	1-124-907-11	ELECT	10MF	20%	50V
C8	1-124-122-11	ELECT	100MF	20%	50V
C9	1-124-122-11	ELECT	100MF	20%	50V
C10	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C11	1-124-907-11	ELECT	10MF	20%	50V
C12	1-124-910-11	ELECT	47MF	20%	50V
C13	1-124-910-11	ELECT	47MF	20%	50V
C14	1-124-910-11	ELECT	47MF	20%	50V
C15	1-124-910-11	ELECT	47MF	20%	50V
C16	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C17	1-124-910-11	ELECT	47MF	20%	50V
C18	1-124-910-11	ELECT	47MF	20%	50V
C23	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C24	1-124-910-11	ELECT	47MF	20%	50V
C25	1-124-910-11	ELECT	47MF	20%	50V
C26	1-124-910-11	ELECT	47MF	20%	50V
C27	1-124-910-11	ELECT	47MF	20%	50V
C28	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C29	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C30	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C31	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C32	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C33	1-124-907-11	ELECT	10MF	20%	50V
C34	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C35	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C36	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C37	1-124-903-11	ELECT	1MF	20%	50V
C39	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C40	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C41	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C42	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C43	1-124-907-11	ELECT	10MF	20%	50V
C44	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C45	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C46	1-124-119-00	ELECT	330MF	20%	16V
C47	1-124-119-00	ELECT	330MF	20%	16V
C48	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C49	1-136-153-00	FILM	0.01MF	5%	50V
C50	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C51	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C52	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C53	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C54	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C55	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C56	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C57	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C58	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C59	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C60	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C61	1-136-177-00	FILM	1MF	5%	50V
C62	1-136-177-00	FILM	1MF	5%	50V
C63	1-124-122-11	ELECT	100MF	20%	50V
C67	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C68	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C69	1-163-120-00	CERAMIC CHIP	130PF	5%	50V
C70	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C71	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C72	**1-124-927-11**	**ELECT**	**4. 7MF**	**20%**	**50V**
C73	1-124-903-11	ELECT	1MF	20%	50V
C74	1-136-171-00	FILM	0.33MF	5%	50V
C75	1-130-479-00	MYLAR	0.0047MF	5%	50V
C76	1-163-157-00	FILM	0.022MF	5%	50V
C77	1-163-157-00	FILM	0.022MF	5%	50V
C78	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C79	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C82	1-136-177-00	FILM	1MF	5%	50V
C83	1-124-907-11	ELECT	10MF	20%	50V
C84	1-124-910-11	ELECT	47MF	20%	50V
C85	1-124-907-11	ELECT	10MF	20%	50V
C86	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C87	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C88	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C89	1-164-161-11	CERAMIC CHIP	0.0022MF		50V
C90	1-124-122-11	ELECT	100MF	20%	50V
C91	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C104	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C106	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C201	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C202	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C203	**1-163-157-00**	**FILM**	**0. 022MF**	**5%**	**50V**
C205	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C207	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C208	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C211	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C212	**1-163-224-11**	**CERAMIC CHIP**	**7P**	**0. 25PF**	**50V**
C213	1-124-122-11	ELECT	100MF	20%	50V
C214	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C215	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C216	1-124-122-11	ELECT	100MF	20%	50V
C217	1-124-122-11	ELECT	100MF	20%	50V
C218	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C219	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C220	1-124-122-11	ELECT	100MF	20%	50V
C221	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C222	1-124-122-11	ELECT	100MF	20%	50V
C223	1-124-122-11	ELECT	100MF	20%	50V
C224	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C229	1-124-907-11	ELECT	10MF	20%	50V
C230	1-124-122-11	ELECT	100MF	20%	50V
C231	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C234	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C235	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C236	1-124-907-11	ELECT	10MF	20%	50V
C237	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C238	1-124-907-11	ELECT	10MF	20%	50V
C239	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C240	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C241	1-124-927-11	ELECT	4.7MF	20%	50V
C242	1-124-907-11	ELECT	10MF	20%	50V
C243	1-124-907-11	ELECT	10MF	20%	50V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C244	1-124-907-11	ELECT	10MF	20%	50V
C301	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C302	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C303	1-126-233-11	ELECT	22MF	20%	50V
C304	1-613-227-11	CERAMIC CHIP	10PF	5%	50V
C305	1-126-233-11	ELECT	22MF	20%	50V
C306	1-124-910-11	ELECT	47MF	20%	50V
C307	1-136-169-00	FILM	0.22MF	5%	50V
C308	1-124-902-00	ELECT	0.47MF	20%	50V
C309	1-124-902-00	ELECT	0.47MF	20%	50V
C310	1-124-902-00	ELECT	0.47MF	20%	50V
C311	1-126-233-11	ELECT	22MF	20%	50V
C312	1-124-910-11	ELECT	47MF	20%	50V
C313	1-124-910-11	ELECT	47MF	20%	50V
C314	1-124-910-11	ELECT	47MF	20%	50V
C315	1-124-910-11	ELECT	47MF	20%	50V
C316	1-124-902-00	ELECT	0.47MF	20%	50V
C317	1-126-101-11	ELECT	100MF	20%	16V
C318	1-124-910-11	ELECT	47MF	20%	50V
C319	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C320	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C321	1-124-907-11	ELECT	10MF	20%	50V
C322	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C323	1-124-907-11	ELECT	10MF	20%	50V
C324	1-124-902-00	ELECT	0.47MF	20%	50V
C325	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C326	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C327	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C328	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C329	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C330	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C331	1-136-177-00	FILM	1MF	5%	50V
C332	1-136-169-00	FILM	0.22MF	5%	50V
C333	1-124-907-11	ELECT	10MF	20%	50V
C334	1-124-910-11	ELECT	47MF	20%	50V
C335	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C336	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C337	1-163-089-00	CERAMIC CHIP	6PF	0.25PF	50V
C338	1-124-907-11	ELECT	10MF	20%	50V
C339	1-124-903-11	ELECT	1MF	20%	50V
C340	1-124-903-11	ELECT	1MF	20%	50V
C341	1-124-907-11	ELECT	10MF	20%	50V
C342	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C343	1-124-910-11	ELECT	47MF	20%	50V
C344	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C346	1-124-907-11	ELECT	10MF	20%	50V
C347	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C350	1-163-117-00	CERAMIC CHIP	100PF	5%	50V

<TRIMMER>

REF.NO.	PART NO.	DESCRIPTION
CT101	1-141-181-11	CAP,TRIMMER
CT102	1-141-181-11	CAP,TRIMMER

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D1	8-719-400-18	DIODE MA152WK	
D2	8-719-400-18	DIODE MA152WK	
D3	8-719-400-18	DIODE MA152WK	
D4	8-719-400-18	DIODE MA152WK	
D5	8-719-400-18	DIODE MA152WK	
D6	8-719-104-34	DIODE 1S2836	
D7	8-719-400-18	DIODE MA152WK	
D8	8-719-400-18	DIODE MA152WK	
D9	8-719-400-18	DIODE MA152WK	
D10	8-719-400-18	DIODE MA152WK	
D11	8-719-800-76	DIODE 1SS226	
D12	8-719-400-18	DIODE MA152WK	
D13	8-719-400-18	DIODE MA152WK	
D14	8-719-400-18	DIODE MA152WK	
D101	8-719-105-46	DIODE RD3.3M-B2	
D102	8-719-105-82	DIODE RD5.1M-B2	
D103	8-719-400-18	DIODE MA152WK	
D107	8-719-400-18	DIODE MA152WK	
D108	8-719-900-95	DIODE V09G	
D109	8-719-900-95	DIODE V09G	
D110	8-719-105-XX	DIODE RD6.2M-B1	
D112	8-719-400-18	DIODE MA152WK	
D113	8-719-400-18	DIODE MA152WK	
D117	8-719-400-18	DIODE MA152WK	
D118	8-719-104-34	DIODE 1S2836	
D119	8-719-400-18	DIODE MA152WK	
D130	8-719-911-19	DIODE 1SS119	
D131	8-719-911-19	DIODE 1SS119	
D132	8-719-104-34	DIODE 1S2836	
D201	8-719-400-18	DIODE MA152WK	
D301	8-719-400-18	DIODE MA152WK	
D303	8-719-400-18	DIODE MA152WK	
D304	8-719-105-63	DIODE RD4.3M-B1	

<DELAY LINE>

REF.NO.	PART NO.	DESCRIPTION
DL101	1-415-122-31	DELAY LINE, 1H (PAL)
DL102	1-415-336-00	DELAY LINE, Y
DL103	1-415-494-11	DELAY LINE, Y
DL104	1-415-494-11	DELAY LINE, Y

<FILTER>

REF.NO.	PART NO.	DESCRIPTION
FL1	1-236-164-11	ENCAPSULATED COMPONENT
FL2	1-236-620-11	FILTER, LOW PASS
FL3	1-236-620-11	FILTER, LOW PASS
FL4	1-236-620-11	FILTER, LOW PASS

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-300-71	IC HD14053BFP
IC2	8-759-513-47	IC TDA4555/V1
IC3	8-759-932-16	IC TDA4565
IC5	8-759-710-42	IC NJM2228M
IC6	8-759-208-94	IC CX-894
IC7	8-759-300-71	IC HD14053BFP
IC8	8-752-034-85	IC CXA1216P
IC9	8-759-100-96	IC UPC4558G2
IC10	8-741-692-01	IC SBX1692-01
IC11	8-759-979-16	IC CX-7916
IC12	1-808-891-11	MODULE (SNY-9202)
IC13	8-759-100-96	IC UPC4558G2
IC14	8-759-059-80	IC SN74LS12NS-T1
IC15	1-809-576-11	MODULE, H8B7178B
IC16	8-759-929-62	IC LM7812CT
IC17	8-759-504-46	IC PQ05RF1
IC19	8-759-926-06	IC SN74HC126ANS

<COIL>

REF.NO.	PART NO.	DESCRIPTION	
L101	1-410-470-11	INDUCTOR	10UH
L102	1-410-209-51	INDUCTOR CHIP	27UH
L103	1-410-466-41	INDUCTOR	4.7UH
L104	1-408-406-00	INDUCTOR	5.6UH
L105	1-404-539-11	COIL	
L106	1-404-554-11	COIL	

BA

REF.NO.	PART NO.	DESCRIPTION	REMARK
L107	1-404-554-11	COIL	
L108	1-404-554-11	COIL	
L109	1-408-397-00	INDUCTOR 1UH	
L110	1-410-466-41	INDUCTOR 4.7UH	
L111	1-410-466-41	INDUCTOR 4.7UH	
L112	1-410-466-41	INDUCTOR 4.7UH	
L114	1-459-155-00	COIL (WITH CORE) 45UH	
L115	1-459-155-00	COIL (WITH CORE) 45UH	
L116	1-410-466-41	INDUCTOR 4.7UH	
L120	1-404-584-11	COIL	
L130	1-410-470-11	INDUCTOR 10UH	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q2	8-729-901-01	TRANSISTOR DTC144EK	
Q3	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q7	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q8	8-729-901-01	TRANSISTOR DTC144EK	
Q9	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q10	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q11	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q12	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q13	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q14	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q15	8-729-901-01	TRANSISTOR DTC144EK	
Q16	8-729-901-01	TRANSISTOR DTC144EK	
Q17	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q18	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q19	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q20	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q21	8-729-901-01	TRANSISTOR DTC144EK	
Q22	8-729-901-01	TRANSISTOR DTC144EK	
Q23	8-729-901-01	TRANSISTOR DTC144EK	
Q24	8-729-901-01	TRANSISTOR DTC144EK	
Q25	8-729-901-01	TRANSISTOR DTC144EK	
Q26	8-729-901-01	TRANSISTOR DTC144EK	
Q27	8-729-901-01	TRANSISTOR DTC144EK	
Q28	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q29	8-729-216-22	TRANSISTOR 2SA1162-G	
Q30	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q31	8-729-216-22	TRANSISTOR 2SA1162-G	
Q32	8-729-216-22	TRANSISTOR 2SA1162-G	
Q33	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q34	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q35	8-729-901-01	TRANSISTOR DTC144EK	
Q36	8-729-216-22	TRANSISTOR 2SA1162-G	
Q37	8-729-901-01	TRANSISTOR DTC144EK	
Q38	8-729-901-01	TRANSISTOR DTC144EK	
Q39	8-729-116-06	TRANSISTOR 2SK160-K6	
Q40	8-729-116-06	TRANSISTOR 2SK160-K6	
Q41	8-729-901-01	TRANSISTOR DTC144EK	
Q43	8-729-901-01	TRANSISTOR DTC144EK	
Q45	8-729-901-01	TRANSISTOR DTC144EK	
Q48	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q49	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q50	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q51	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q52	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q118	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q119	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q120	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q152	8-729-901-01	TRANSISTOR DTC144EK	
Q201	8-729-901-01	TRANSISTOR DTC144EK	
Q202	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q203	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q204	8-729-901-01	TRANSISTOR DTC144EK	
Q205	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q206	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q207	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q208	8-729-901-01	TRANSISTOR DTC144EK	
Q209	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q210	8-729-216-22	TRANSISTOR 2SA1162-G	
Q212	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q213	8-729-216-22	TRANSISTOR 2SA1162-G	
Q301	8-729-140-96	TRANSISTOR 2SD774-34	
Q302	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q303	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q304	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q305	8-729-901-01	TRANSISTOR DTC144EK	
Q306	8-729-901-01	TRANSISTOR DTC144EK	
Q307	8-729-901-01	TRANSISTOR DTC144EK	
Q308	8-729-901-01	TRANSISTOR DTC144EK	
Q309	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q310	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q311	8-729-901-01	TRANSISTOR DTC144EK	
Q312	8-729-901-01	TRANSISTOR DTC144EK	
Q313	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q314	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q315	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q316	8-729-901-01	TRANSISTOR DTC144EK	
Q317	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q318	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q319	8-729-901-01	TRANSISTOR DTC144EK	
Q320	8-729-901-01	TRANSISTOR DTC144EK	
Q321	8-729-901-01	TRANSISTOR DTC144EK	
Q323	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q324	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q325	8-729-901-01	TRANSISTOR DTC144EK	
Q326	8-729-901-01	TRANSISTOR DTC144EK	
Q327	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q329	8-729-116-06	TRANSISTOR 2SK160-K6	
Q330	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q336	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q337	8-729-216-22	TRANSISTOR 2SA1162-G	
Q338	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q340	8-729-901-01	TRANSISTOR DTC144EK	
Q350	8-729-900-89	TRANSISTOR DTC144ES	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
R1	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R2	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R3	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R4	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R6	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R7	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R8	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R11	1-216-643-11	METAL CHIP 470 0.50% 1/10W	
R12	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R13	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R14	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R15	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R16	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R17	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R18	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R19	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R20	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R21	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R22	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R23	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R24	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R25	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R26	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R27	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R29	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R30	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R31	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R32	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R33	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R34	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R38	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R39	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R40	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R41	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R42	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R43	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R44	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R45	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R46	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R47	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R48	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R49	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R50	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R51	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R52	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R53	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R54	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R55	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R56	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R57	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R58	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R59	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R60	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R61	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R63	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R64	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R65	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R66	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R67	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R68	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R69	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R70	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R71	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R72	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R73	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R74	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R75	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R76	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R77	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R78	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R80	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R81	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R82	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R83	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R84	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R85	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R86	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R87	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R88	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R89	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R90	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R91	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R92	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R93	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R94	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R95	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R101	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R102	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R103	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R104	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R105	1-216-066-00	METAL GLAZE	5.1K	5%	1/10W	
R106	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R107	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R108	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R116	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R117	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R118	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R119	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R120	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R121	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R122	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R123	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R124	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R125	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R126	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R127	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R128	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R129	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R130	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R131	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W	
R132	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R133	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R134	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R135	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R141	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R142	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R143	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R145	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R146	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R148	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R149	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R150	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R201	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R202	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R203	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R204	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R205	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R206	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R207	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R208	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R209	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R210	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R211	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R212	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R213	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R214	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R215	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R216	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R217	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W	
R218	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R219	1-216-023-00	METAL GLAZE	82	5%	1/10W	
R220	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R221	1-216-035-00	METAL GLAZE	270	5%	1/10W	

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REF.NO.	PART NO.	DESCRIPTION				REMARK
R222	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R223	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R224	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R225	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R226	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R227	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R228	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R229	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R230	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R231	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R232	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R233	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R234	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R235	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R236	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R237	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R238	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R239	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R240	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R241	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R242	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R244	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R290	1-249-441-11	CARBON	100K	5%	1/4W	
R301	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R302	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R303	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R304	1-216-119-00	METAL GLAZE	820K	5%	1/10W	
R305	1-216-005-00	METAL GLAZE	15	5%	1/10W	
R306	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R307	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R308	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R309	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R310	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R311	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R312	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R313	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R314	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R315	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R316	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R317	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R318	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R319	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R320	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R321	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R322	1-216-689-11	METAL CHIP	39K	0.50%	1/10W	
R323	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R324	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R325	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R326	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R327	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R328	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R329	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R330	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R331	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R332	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R333	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R334	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R335	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R336	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R337	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R338	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R339	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R340	1-216-061-00	METAL GLAZE	3. 3K	5%	1/10W	
R341	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R342	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R343	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R344	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R345	1-216-109-00	METAL GLAZE	330K	5%	1/10W	
R346	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R347	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R348	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R349	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R350	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R351	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R352	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R353	1-216-101-00	CERAMIC CHIP	180K	5%	1/10W	
R354	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R355	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R356	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R357	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R358	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R359	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R360	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R361	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R362	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R363	1-216-023-00	METAL GLAZE	82	5%	1/10W	
R364	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R365	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R366	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R367	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R368	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R369	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R370	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R371	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W	
R372	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R373	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R374	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R375	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R376	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R377	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R378	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R379	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R380	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R381	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R382	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R383	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R384	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R385	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R386	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R387	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R388	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R389	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R390	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R391	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R392	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R393	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R394	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R395	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R396	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R397	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R398	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R399	1-216-013-00	METAL GLAZE	33	5%	1/10W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
RV101	1-230-504-11	RES, ADJ, CARBON 220	
RV102	1-228-993-00	RES, ADJ, CARBON 4.7K	

REF.NO.	PART NO.	DESCRIPTION	REMARK
RV103	1-226-775-11	RES, ADJ, METAL GLAZE 100K	
RV104	1-226-775-11	RES, ADJ, METAL GLAZE 100K	
RV105	1-228-993-00	RES, ADJ, CARBON 4.7K	

<THERMISTER>

REF.NO.	PART NO.	DESCRIPTION	REMARK
TH101	1-800-071-XX	THERMISTER	

<CRYSTAL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
X101	1-567-413-11	VIBRATOR, CRYSTAL	
X102	1-527-789-00	VINRATOR, CRYSTAL	

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*A-1135-693-A BB BOARD, COMPLETE
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REF.NO.	PART NO.	DESCRIPTION	REMARK
	*1-564-595-11	PLUG, CONNECTOR 14P	
	*1-568-984-11	CONNECTOR, MALE 96P	
	4-382-854-11	SCREW (M3X10), P, SW (+)	

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C402	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C404	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C405	1-126-101-11	ELECT	100MF	20%	16V
C406	1-124-120-11	ELECT	220MF	20%	16V
C407	1-126-101-11	ELECT	100MF	20%	16V
C408	1-124-907-11	ELECT	10MF	20%	50V
C409	1-126-101-11	ELECT	100MF	20%	16V
C412	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C413	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C414	1-124-907-11	ELECT	10MF	20%	50V
C415	1-126-101-11	ELECT	100MF	20%	16V
C416	1-126-101-11	ELECT	100MF	20%	16V
C417	1-124-120-11	ELECT	220MF	20%	16V
C418	1-126-101-11	ELECT	100MF	20%	16V
C419	1-126-101-11	ELECT	100MF	20%	16V
C425	1-126-101-11	ELECT	100MF	20%	16V
C450	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C451	1-126-103-11	ELECT	470MF	20%	16V
C453	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C501	1-124-907-11	ELECT	10MF	20%	50V
C502	1-124-907-11	ELECT	10MF	20%	50V
C503	1-124-477-11	ELECT	47MF	20%	16V
C504	1-124-477-11	ELECT	47MF	20%	16V
C505	1-124-927-11	ELECT	4.7MF	20%	50V
C506	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C507	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C508	1-124-477-11	ELECT	47MF	20%	16V
C509	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C510	1-124-477-11	ELECT	47MF	20%	16V
C511	1-126-103-11	ELECT	470MF	20%	16V
C512	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C513	1-124-477-11	ELECT	47MF	20%	16V
C514	1-124-927-11	ELECT	4.7MF	20%	50V
C515	1-124-927-11	ELECT	4.7MF	20%	50V
C516	1-124-927-11	ELECT	4.7MF	20%	50V
C518	1-124-907-11	ELECT	10MF	20%	50V
C519	1-124-907-11	ELECT	10MF	20%	50V
C520	1-124-903-11	ELECT	1MF	20%	50V
C521	1-124-907-11	ELECT	10MF	20%	50V
C522	1-124-907-11	ELECT	10MF	20%	50V
C523	1-163-833-00	CERAMIC CHIP	0.068MF		25V
C524	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C525	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C526	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C527	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C528	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C529	1-126-233-11	ELECT	22MF	20%	50V
C650	1-124-657-00	ELECT	10MF	20%	50V
C651	1-136-169-00	FILM	0.22MF	5%	50V
C652	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C653	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C654	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C655	1-124-910-11	ELECT	47MF	20%	50V
C657	1-126-103-11	ELECT	470MF	20%	16V
C658	1-124-122-11	ELECT	100MF	20%	50V
C660	1-124-907-11	ELECT	10MF	20%	50V
C692	1-124-122-11	ELECT	100MF	20%	50V
C693	1-124-122-11	ELECT	100MF	20%	50V
C694	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C695	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C696	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C697	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C700	1-124-657-00	ELECT	10MF	20%	50V
C701	1-136-169-00	FILM	0.22MF	5%	50V
C702	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C703	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C707	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C708	1-124-910-11	ELECT	47MF	20%	50V
C710	1-124-122-11	ELECT	100MF	20%	50V
C711	1-126-103-11	ELECT	470MF	20%	16V
C713	1-124-907-11	ELECT	10MF	20%	50V
C750	1-124-657-00	ELECT	10MF	20%	50V
C751	1-136-169-00	FILM	0.22MF	5%	50V
C752	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C753	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C754	1-126-101-11	ELECT	100MF	20%	16V
C755	1-126-101-11	ELECT	100MF	20%	16V
C756	1-126-101-11	ELECT	100MF	20%	16V
C757	1-124-910-11	ELECT	47MF	20%	50V
C759	1-124-122-11	ELECT	100MF	20%	50V
C760	1-126-103-11	ELECT	470MF	20%	16V
C762	1-126-233-11	ELECT	22MF	20%	50V
C763	1-124-907-11	ELECT	10MF	20%	50V
C914	1-126-101-11	ELECT	100MF	20%	16V

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D401	8-719-900-95	DIODE V09G	
D402	8-719-900-95	DIODE V09G	
D450	8-719-400-18	DIODE MA152WK	
D451	8-719-400-18	DIODE MA152WK	
D452	8-719-105-28	DIODE RD2.4M-B	
D501	8-719-400-18	DIODE MA152WK	
D502	8-719-400-18	DIODE MA152WK	
D503	8-719-400-18	DIODE MA152WK	
D504	8-719-105-82	DIODE RD5.1M-B2	
D506	8-719-105-82	DIODE RD5.1M-B2	
D507	8-719-105-82	DIODE RD5.1M-B2	
D508	8-719-105-82	DIODE RD5.1M-B2	
D509	8-719-105-82	DIODE RD5.1M-B2	
D510	8-719-105-82	DIODE RD5.1M-B2	
D511	8-719-105-82	DIODE RD5.1M-B2	
D512	8-719-105-82	DIODE RD5.1M-B2	
D513	8-719-105-82	DIODE RD5.1M-B2	
D514	8-719-105-82	DIODE RD5.1M-B2	

BB

REF.NO.	PART NO.	DESCRIPTION	REMARK
D515	8-719-105-82	DIODE RD5.1M-B2	
D516	8-719-106-80	DIODE RD13M-B2	
D518	8-719-106-80	DIODE RD13M-B2	
D520	8-719-105-82	DIODE RD5.1M-B2	
D521	8-719-105-82	DIODE RD5.1M-B2	
D522	8-719-106-80	DIODE RD13M-B2	
D523	8-719-106-80	DIODE RD13M-B2	
D524	8-719-105-82	DIODE RD5.1M-B2	
D525	8-719-105-28	DIODE RD2.4M-B	
D526	8-719-400-18	DIODE MA152WK	
D527	8-719-105-82	DIODE RD5.1M-B2	
D528	8-719-400-18	DIODE MA152WK	
D529	8-719-105-46	DIODE RD3.3M-B2	
D530	8-719-400-18	DIODE MA152WK	
D634	8-719-400-18	DIODE MA152WK	
D652	8-719-400-18	DIODE MA152WK	
D653	8-719-400-18	DIODE MA152WK	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC401	8-759-800-81	IC LA7016	
IC402	8-759-929-62	IC LM7812CT	
IC403	8-759-929-65	IC LM7912CT	
IC404	8-759-300-71	IC HD14053BFP	
IC405	8-759-926-18	IC SN74HC157ANS	
IC407	8-759-926-18	IC SN74HC157ANS	
IC408	8-759-300-71	IC HD14053BFP	
IC409	8-759-300-71	IC HD14053BFP	
IC410	8-759-100-96	IC UPC4558G2	
IC411	8-759-100-96	IC UPC4558G2	
IC412	8-759-145-27	IC UPC1406HA	
IC413	8-749-922-84	IC BX-6474	
IC414	8-749-922-83	IC BX-6473	
IC415	8-749-922-83	IC BX-6473	
IC416	8-749-922-83	IC BX-6473	
IC417	8-749-922-86	IC BX-7913	
IC418	8-749-922-85	IC BX-6475	
IC419	8-749-922-85	IC BX-6475	
IC420	8-749-922-85	IC BX-6475	
IC422	8-759-100-93	IC UPC393G2	
IC423	8-759-916-25	IC SN74HC32AN	
IC424	8-759-100-93	IC UPC393G2	

<JACK>

REF.NO.	PART NO.	DESCRIPTION	REMARK
J101	1-566-980-21	CONNECTOR, ROUND TYPE 4P	
J102	1-537-257-11	TERMINAL BOARD, INPUT/OUTPUT	
J103	1-537-403-11	TERMINAL BOARD, INPUT/OUTPUT	

<COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
L401	1-459-155-00	COIL (WITH CORE) 45UH	
L402	1-459-155-00	COIL (WITH CORE) 45UH	
L403	1-459-155-00	COIL (WITH CORE) 45UH	
L404	1-459-155-00	COIL (WITH CORE) 45UH	
L405	1-410-671-31	INDUCTOR 47UH	
L605	1-410-482-31	INDUCTOR 100UH	
L651	1-410-482-31	INDUCTOR 100UH	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q401	8-729-140-96	TRANSISTOR 2SD774-34	
Q402	8-729-140-97	TRANSISTOR 2SB734-34	
Q403	8-729-901-01	TRANSISTOR DTC144EK	
Q404	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q405	8-729-901-01	TRANSISTOR DTC144EK	
Q450	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q451	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q452	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q453	8-729-901-01	TRANSISTOR DTC144EK	
Q454	8-729-901-01	TRANSISTOR DTC144EK	
Q456	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q457	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q501	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q502	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q503	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q504	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q506	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q507	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q508	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q509	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q510	8-729-901-01	TRANSISTOR DTC144EK	
Q511	8-729-901-01	TRANSISTOR DTC144EK	
Q512	8-729-901-01	TRANSISTOR DTC144EK	
Q513	8-729-901-01	TRANSISTOR DTC144EK	
Q514	8-729-901-01	TRANSISTOR DTC144EK	
Q515	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q516	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q517	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q518	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q519	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q520	8-729-901-01	TRANSISTOR DTC144EK	
Q521	8-729-901-01	TRANSISTOR DTC144EK	
Q522	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q523	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q524	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q525	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q526	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q527	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q528	8-729-901-01	TRANSISTOR DTC144EK	
Q529	8-729-901-01	TRANSISTOR DTC144EK	
Q530	8-729-901-01	TRANSISTOR DTC144EK	
Q531	8-729-901-01	TRANSISTOR DTC144EK	
Q532	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q533	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q534	8-729-320-62	TRANSISTOR 2SD789-34	
Q535	8-729-901-01	TRANSISTOR DTC144EK	
Q536	8-729-901-01	TRANSISTOR DTC144EK	
Q537	8-729-901-01	TRANSISTOR DTC144EK	
Q538	8-729-901-01	TRANSISTOR DTC144EK	
Q539	8-729-901-01	TRANSISTOR DTC144EK	
Q540	8-729-901-01	TRANSISTOR DTC144EK	
Q541	8-729-901-01	TRANSISTOR DTC144EK	
Q542	8-729-901-01	TRANSISTOR DTC144EK	
Q543	8-729-901-01	TRANSISTOR DTC144EK	
Q544	8-729-901-01	TRANSISTOR DTC144EK	
Q545	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q546	8-729-901-01	TRANSISTOR DTC144EK	
Q547	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q548	8-729-901-01	TRANSISTOR DTC144EK	
Q549	8-729-901-01	TRANSISTOR DTC144EK	
Q550	8-729-901-01	TRANSISTOR DTC144EK	
Q551	8-729-901-01	TRANSISTOR DTC144EK	
Q552	8-729-901-01	TRANSISTOR DTC144EK	
Q553	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q650	8-729-116-05	TRANSISTOR 2SK160-K5	
Q651	8-729-107-31	TRANSISTOR 2SC3545-T43	

BB

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q652	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q653	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q654	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q656	8-729-901-01	TRANSISTOR DTC144EK	
Q700	8-729-116-05	TRANSISTOR 2SK160-K5	
Q701	8-729-107-31	**TRANSISTOR** 2SC3545-T43	
Q702	8-729-107-31	**TRANSISTOR** 2SC3545-T43	
Q703	**8-729-112-65**	**TRANSISTOR** 2SA1462-Y33	
Q704	**8-729-923-06**	**TRANSISTOR** FMW-8	
Q705	8-729-107-31	**TRANSISTOR** 2SC3545-T43	
Q706	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q707	8-729-923-06	TRANSISTOR FMW-8	
Q708	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q709	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q710	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q741	8-729-901-01	TRANSISTOR DTC144EK	
Q750	8-729-116-05	TRANSISTOR 2SK160-K5	
Q751	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q752	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q753	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q754	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q755	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q756	8-729-901-01	TRANSISTOR DTC144EK	
Q757	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q800	**8-729-119-78**	**TRANSISTOR 2SC2785-HFE**	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R401	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R403	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R404	1-216-693-11	METAL CHIP	56K	0.50%	1/10W	
R405	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R450	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R451	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R452	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R453	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R454	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R455	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R456	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R459	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R460	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R461	**1-216-017-00**	**METAL GLAZE**	**47**	**5%**	**1/10W**	
R462	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R463	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R464	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R466	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R467	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R468	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R469	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R470	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R471	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R472	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R473	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R474	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R501	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R502	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R503	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R504	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R505	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R506	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R507	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R508	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R509	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R510	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R511	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R512	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R513	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R514	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R516	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R518	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R519	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R520	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R521	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R522	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R523	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R524	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R525	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R526	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R527	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R528	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R529	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R530	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R531	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R532	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R533	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R534	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R535	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R536	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R537	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R538	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R539	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R540	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R541	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R542	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R543	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R544	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R545	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R546	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R547	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R548	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R549	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R550	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R551	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R552	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R553	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R554	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R555	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R556	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R557	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R558	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R559	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R560	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R561	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R562	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R563	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R564	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R565	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R566	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R567	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R568	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R569	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R570	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R571	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R572	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R573	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R574	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R575	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R576	1-216-073-00	METAL GLAZE	10K	5%	1/10W	

BB

REF.NO.	PART NO.	DESCRIPTION				REMARK
R577	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R578	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R579	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R580	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R581	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R582	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R583	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R584	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R585	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R586	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R587	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R588	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R589	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R590	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R591	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R592	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R593	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R594	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R595	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R596	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R597	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R598	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R599	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R600	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R601	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R602	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R603	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R604	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R605	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R606	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R607	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R608	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R609	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R610	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R611	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R612	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R613	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R614	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R615	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R616	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R617	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R618	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R619	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R620	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R621	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R622	1-216-448-11	METAL OXIDE	39	5%	2W	F
R623	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R624	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R625	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R626	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R627	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R628	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R629	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R630	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R631	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R632	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R633	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R634	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R635	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R636	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R637	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R638	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R639	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R640	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R641	1-249-425-11	CARBON	4.7K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R642	1-249-441-11	CARBON	100K	5%	1/4W	
R643	1-249-441-11	CARBON	100K	5%	1/4W	
R650	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R651	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R652	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R653	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R654	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R655	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R656	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R657	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R658	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R659	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R660	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R661	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R663	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R664	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R665	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R686	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R688	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R700	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R701	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R702	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R703	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R704	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R705	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R706	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R707	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R708	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R709	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R710	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R711	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R712	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R713	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R714	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R715	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R716	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R717	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R718	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R719	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R720	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R721	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R722	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R723	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R724	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R725	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R727	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R728	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R729	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R750	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R751	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R752	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R753	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R755	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R756	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R757	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R758	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R759	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R760	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W	
R761	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R762	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R763	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R764	1-216-025-00	METAL GLAZE	100	5%	1/10W	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION			REMARK
R765	1-216-624-11	METAL CHIP	75	0.50%	1/10W
R766	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R768	1-216-001-00	METAL GLAZE	10	5%	1/10W
R769	1-216-017-00	METAL GLAZE	47	5%	1/10W
R770	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R791	1-216-041-00	METAL GLAZE	470	5%	1/10W
R836	1-216-631-11	METAL CHIP	150	0.50%	1/10W
R837	1-216-631-11	METAL CHIP	150	0.50%	1/10W
R900	1-249-427-11	CARBON	1K	5%	1/4W

<RELAY>

REF.NO.	PART NO.	DESCRIPTION
RL401	1-515-757-11	RELAY
RL402	1-515-757-11	RELAY
RL403	1-515-757-11	RELAY

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION
SW101	1-570-859-11	SWITCH, SLIDE

****

REF.NO.	PART NO.	DESCRIPTION
	*1-639-938-11	PB BOARD ********
	*1-564-506-11	PLUG, CONNECTOR 3P
	*4-341-751-01	EYELET (EY25)
	*4-341-752-01	EYELET

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C501	1-136-103-00	FILM	0.1MF	5%	200V
C502	1-136-103-00	FILM	0.1MF	5%	200V

<FLYBACK>

REF.NO.	PART NO.	DESCRIPTION
FBT1	⚠ 1-439-466-12	TRANSFORMER ASS'Y, FLYBACK (NX-2500)
FBT2	⚠ 1-439-466-21	TRANSFORMER ASS'Y, FLYBACK (NX-2502)

<NEON LAMP>

REF.NO.	PART NO.	DESCRIPTION
NL501	1-519-108-XX	LAMP, NEON
NL502	1-519-108-XX	LAMP, NEON

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REF.NO.	PART NO.	DESCRIPTION
	*A-1195-044-A	PA BOARD, COMPLETE ******************
	1-506-348-XX	PIN, CONNECOTR 5P
	*1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P
	*1-564-518-11	PLUG, CONNECTOR 3P
	*1-564-520-11	PLUG, CONNECTOR 5P
	*1-564-521-11	PLUG, CONNECTOR 6P
	*1-564-523-11	PLUG, CONNECTOR 8P
	*1-564-526-11	PLUG, CONNECTOR 11P
	*1-564-528-11	PLUG, CONNECTOR 13P
	*4-341-751-01	EYELET
	4-382-854-11	SCREW (M3X10), P, SW (+)
	*4-391-515-11	SHEET (A), INSULATOR

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C1	1-124-903-11	ELECT	1MF	20%	50V
C2	1-124-903-11	ELECT	1MF	20%	50V
C3	1-124-927-11	ELECT	4.7MF	20%	50V
C4	1-124-927-11	ELECT	4.7MF	20%	50V
C5	1-124-927-11	ELECT	4.7MF	20%	50V
C6	1-124-927-11	ELECT	4.7MF	20%	50V
C7	1-124-907-11	ELECT	10MF	20%	50V
C8	1-136-153-00	FILM	0.01MF	5%	50V
C9	1-124-034-51	ELECT	33MF	20%	16V
C10	1-124-925-11	ELECT	2.2MF	20%	50V
C11	1-136-165-00	FILM	0.1MF	5%	50V
C12	1-124-907-11	ELECT	10MF	20%	50V
C13	1-136-169-00	FILM	0.22MF	5%	50V
C14	1-124-907-11	ELECT	10MF	20%	50V
C15	1-124-119-00	ELECT	330MF	20%	16V
C16	1-102-824-00	CERAMIC	470PF	5%	50V
C17	1-136-165-00	FILM	0.1MF	5%	50V
C18	1-136-165-00	FILM	0.1MF	5%	50V
C19	1-136-165-00	FILM	0.1MF	5%	50V
C20	1-136-165-00	FILM	0.1MF	5%	50V
C21	1-124-907-11	ELECT	10MF	20%	50V
C22	1-136-169-00	FILM	0.22MF	5%	50V
C23	1-108-796-11	MYLAR	0.0022MF	5%	50V
C24	1-108-796-11	MYLAR	0.0022MF	5%	50V
C25	1-102-973-00	CERAMIC	100PF	5%	50V
C26	1-124-907-11	ELECT	10MF	20%	50V
C27	1-124-925-11	ELECT	2.2MF	20%	50V
C28	1-136-171-00	FILM	0.033MF	5%	50V
C29	1-124-927-11	ELECT	4.7MF	20%	50V
C30	1-101-004-00	CERAMIC	0.01MF		50V
C31	1-101-004-00	CERAMIC	0.01MF		50V
C32	1-102-973-00	CERAMIC	100PF	5%	50V
C33	1-102-973-00	CERAMIC	100PF	5%	50V
C34	1-102-973-00	CERAMIC	100PF	5%	50V
C35	1-101-884-00	CERAMIC	56PF	5%	50V
C36	1-136-165-00	FILM	0.1MF	5%	50V
C37	1-102-030-00	CERAMIC	330PF	10%	500V
C38	1-124-903-11	ELECT	1MF	20%	50V
C39	1-124-903-11	ELECT	1MF	20%	50V
C40	1-108-700-11	MYLAR	0.047MF	10%	200V
C41	1-108-704-11	MYLAR	0.1MF	10%	200V
C42	1-124-903-11	ELECT	1MF	20%	50V
C43	1-102-973-00	CERAMIC	100PF	5%	50V
C44	1-162-117-00	CERAMIC	100PF	10%	500V
C45	1-124-563-11	ELECT	2200MF	20%	25V
C46	1-126-101-11	ELECT	100MF	20%	16V
C47	1-124-927-11	ELECT	4.7MF	20%	50V
C51	⚠ 1-136-948-11	FILM	24000MF	3%	1.6KV
C52	1-123-024-21	ELECT	33MF		160V
C53	1-136-134-00	FILM	1.5MF	5%	400V
C54	⚠ 1-136-134-11	FILM	1.5MF	5%	400V
C55	1-126-233-11	ELECT	22MF	20%	50V
C56	1-126-233-11	ELECT	22MF	20%	50V
C58	1-124-477-11	ELECT	47MF	20%	16V
C59	1-136-165-00	FILM	0.1MF	5%	50V
C60	1-101-004-00	CERAMIC	0.01MF		50V
C61	1-101-004-00	CERAMIC	0.01MF		50V
C62	1-136-165-00	FILM	0.1MF	5%	50V
C63	1-136-165-00	FILM	0.1MF	5%	50V
C64	1-136-153-00	FILM	0.01MF	5%	50V
C65	1-136-103-00	FILM	0.1MF	5%	200V
C67	1-101-004-00	CERAMIC	0.01MF		50V
C68	1-101-004-00	CERAMIC	0.01MF		50V

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D3	8-719-911-19	DIODE 1SS119
D4	8-719-911-19	DIODE 1SS119

The components identified by ☒ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

PA

REF.NO.	PART NO.	DESCRIPTION	REMARK
D5	8-719-109-85	DIODE RD5.1ES-B2	
D6	8-719-911-19	DIODE 1SS119	
D7	8-719-911-19	DIODE 1SS119	
D8	8-719-911-19	DIODE 1SS119	
D9	8-719-911-19	DIODE 1SS119	
D10	8-719-109-85	DIODE RD5.1ES-B2	
D11	8-719-911-19	DIODE 1SS119	
D12	8-719-109-85	DIODE RD5.1ES-B2	
D13	8-719-911-19	DIODE 1SS119	
D14	8-719-109-85	DIODE RD5.1ES-B2	
D16	8-719-911-19	DIODE 1SS119	
D18	8-719-911-19	DIODE 1SS119	
D20	8-719-945-80	DIODE ERC06-15S	
D21	8-719-945-80	DIODE ERC06-15S	
D22	8-719-300-80	DIODE RU-1C	
D23	8-719-900-26	DIODE ERD29-08J	
D24	8-719-911-19	DIODE 1SS119	
D25	8-719-911-19	DIODE 1SS119	
D28	8-719-911-19	DIODE 1SS119	
D29	8-719-911-19	DIODE 1SS119	
D31	8-719-911-19	DIODE 1SS119	
D32	8-719-900-95	DIODE V09G	
D35	8-719-911-19	DIODE 1SS119	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC1	8-759-990-82	IC TL082CP	
IC2	8-759-987-16	IC LM393P	
IC3	8-759-987-16	IC LM393P	
IC4	8-759-987-16	IC LM393P	
IC5	8-759-929-62	IC LM7812CT	
IC6	8-759-100-75	IC UPC1394C	
IC7	8-759-240-40	IC TC4040BP	
IC8	8-759-045-72	IC MC14572UBCP	
IC9	8-759-908-15	IC TL431CLP	

<COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
L1	1-459-614-11	COIL, CHOKE 90UH	
L2	1-459-863-11	COIL, CHOKE 2.1MMH	
L3	⚠ 1-459-863-11	COIL, CHOKE 2.1MMH	
L4	⚠ 1-459-863-11	COIL, CHOKE 2.1MMH	
L5	1-459-155-00	COIL (WITH CORE) 45UH	
L6	1-459-155-00	COIL (WITH CORE) 45UH	

<NEON LAMP>

REF.NO.	PART NO.	DESCRIPTION	REMARK
NL1	1-519-108-XX	LAMP, NEON	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q4	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q5	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q6	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q7	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q8	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q10	8-729-805-07	TRANSISTOR 2SD1887-CA	
Q11	8-729-201-62	TRANSISTOR 2SC2555-2	
Q12	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q13	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q18	8-729-804-48	TRANSISTOR 2SC3675	
Q20	8-729-119-76	TRANSISTOR 2SA1175-HFE	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
☒R1	⚠	METAL			1/4W	
R2	1-249-433-11	CARBON	22K	5%	1/4W	
R3	1-249-439-11	CARBON	68K	5%	1/4W	
☒R4	⚠	METAL			1/4W	
R5	1-249-433-11	CARBON	22K	5%	1/4W	
R6	1-249-439-11	CARBON	68K	5%	1/4W	
R7	1-249-433-11	CARBON	22K	5%	1/4W	
R8	1-249-433-11	CARBON	22K	5%	1/4W	
R9	1-249-423-11	CARBON	3.3K	5%	1/4W	
R10	1-249-429-11	CARBON	10K	5%	1/4W	
R11	1-249-435-11	CARBON	33K	5%	1/4W	
R12	1-249-429-11	CARBON	10K	5%	1/4W	
R13	1-249-429-11	CARBON	10K	5%	1/4W	
R14	1-215-453-00	METAL	22K	1%	1/4W	
R15	1-215-453-00	METAL	22K	1%	1/4W	
R16	1-249-433-11	CARBON	22K	5%	1/4W	
R17	1-249-429-11	CARBON	10K	5%	1/4W	
R18	1-249-429-11	CARBON	10K	5%	1/4W	
R19	1-249-429-11	CARBON	10K	5%	1/4W	
R20	1-249-433-11	CARBON	22K	5%	1/4W	
R21	1-249-441-11	CARBON	100K	5%	1/4W	
R22	1-215-463-00	METAL	56K	1%	1/4W	
R23	1-215-455-00	METAL	27K	1%	1/4W	
R24	1-249-429-11	CARBON	10K	5%	1/4W	
R25	1-249-435-11	CARBON	33K	5%	1/4W	
R26	1-249-417-11	CARBON	1K	5%	1/4W	
R28	1-215-423-00	METAL	1.2K	1%	1/4W	
☒R29	⚠	METAL			1/4W	
☒R30	⚠	METAL			1/4W	
R31	1-249-429-11	CARBON	10K	5%	1/4W	
R32	1-215-473-00	METAL	150K	1%	1/4W	
☒R33	⚠	CARBON			1/4W	
☒R34	⚠	CARBON			1/4W	
R35	1-249-417-11	CARBON	1K	5%	1/4W	
R36	1-249-423-11	CARBON	3.3K	5%	1/4W	
R37	1-215-469-00	METAL	100K	1%	1/4W	
R38	1-215-453-00	METAL	22K	1%	1/4W	
R39	1-215-455-00	METAL	27K	1%	1/4W	
R40	1-249-417-11	CARBON	1K	5%	1/4W	
☒R41	⚠	CARBON			1/4W	
☒R42	⚠	CARBON			1/4W	
R43	1-215-461-00	METAL	47K	1%	1/4W	
R44	1-215-432-00	METAL	3K	1%	1/4W	
R45	1-215-432-00	METAL	3K	1%	1/4W	
R46	1-215-432-00	METAL	3K	1%	1/4W	
R47	1-215-432-00	METAL	3K	1%	1/4W	
R48	1-215-469-00	METAL	100K	1%	1/4W	
R49	1-215-469-00	METAL	100K	1%	1/4W	
R50	1-215-469-00	METAL	100K	1%	1/4W	
R53	1-249-419-11	CARBON	1.5K	5%	1/4W	
R55	1-215-429-00	METAL	2.2K	1%	1/4W	
R56	1-215-445-00	METAL	10K	1%	1/4W	
R57	1-249-441-11	CARBON	100K	5%	1/4W	
R58	1-249-441-11	CARBON	100K	5%	1/4W	
R59	1-249-413-11	CARBON	470	5%	1/4W	
R60	1-249-437-11	CARBON	47K	5%	1/4W	
R61	1-215-443-00	METAL	8.2K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R62	1-215-455-00	METAL	27K	1%	1/4W	
R63	1-249-431-11	CARBON	15K	5%	1/4W	
R64	1-249-417-11	CARBON	1K	5%	1/4W	
R65	1-249-435-11	CARBON	33K	5%	1/4W	
R66	1-249-441-11	CARBON	100K	5%	1/4W	
R67	1-247-903-00	CARBON	1M	5%	1/4W	
R68	1-249-417-11	CARBON	1K	5%	1/4W	
R69	1-249-423-11	CARBON	3.3K	5%	1/4W	
R70	1-249-429-11	CARBON	10K	5%	1/4W	
R71	1-249-417-11	CARBON	1K	5%	1/4W	
R72	1-249-423-11	CARBON	3.3K	5%	1/4W	
R73	1-249-423-11	CARBON	3.3K	5%	1/4W	
R74	1-249-417-11	CARBON	1K	5%	1/4W	
R75	1-249-417-11	CARBON	1K	5%	1/4W	
R76	1-249-417-11	CARBON	1K	5%	1/4W	
R77	1-216-489-11	METAL OXIDE	27K	5%	3W	F
R78	1-216-489-11	METAL OXIDE	27K	5%	3W	F
R79	1-249-425-11	CARBON	4.7K	5%	1/4W	
R80	1-249-423-11	CARBON	3.3K	5%	1/4W	
R81	1-247-725-11	CARBON	10K	5%	1/4W	F
R82	1-249-441-11	CARBON	100K	5%	1/4W	
R86	1-249-460-11	CARBON	15K	5%	1/4W	F
R87	1-249-421-11	CARBON	2.2K	5%	1/4W	
R88	1-249-441-11	CARBON	100K	5%	1/4W	
R89	1-216-378-11	METAL OXIDE	5.6	5%	2W	F
R90	1-249-417-11	CARBON	1K	5%	1/4W	
R91	1-249-417-11	CARBON	1K	5%	1/4W	
R92	1-247-903-00	CARBON	1M	5%	1/4W	
R93	1-249-439-11	CARBON	68K	5%	1/4W	
R95	1-215-461-00	METAL	47K	1%	1/4W	
R96	1-249-437-11	CARBON	47K	5%	1/4W	
R97	1-249-433-11	CARBON	22K	5%	1/4W	
R99	1-249-405-11	CARBON	100	5%	1/4W	
R101	1-249-405-11	CARBON	100	5%	1/4W	
R102	1-249-441-11	CARBON	100K	5%	1/4W	
R103	1-249-417-11	CARBON	1K	5%	1/4W	
R104	1-249-441-11	CARBON	100K	5%	1/4W	
R105	1-249-429-11	CARBON	10K	5%	1/4W	
R106	1-249-425-11	CARBON	4.7K	5%	1/4W	
R107	1-249-433-11	CARBON	22K	5%	1/4W	
R108	1-249-441-11	CARBON	100K	5%	1/4W	
R109	1-249-437-11	CARBON	47K	5%	1/4W	
R110	1-249-441-11	CARBON	100K	5%	1/4W	
R111	1-249-437-11	CARBON	47K	5%	1/4W	
R113	1-249-405-11	CARBON	100	5%	1/4W	
R114	1-216-489-11	METAL OXIDE	27K	5%	3W	F
R116	1-214-782-00	METAL	160K	1%	1/4W	
R117	1-247-725-11	CARBON	10K	5%	1/4W	F
R118	1-202-730-00	SOLID	8.2M	10%	1/2W	
R119	1-215-432-00	METAL	3K	1%	1/4W	
R120	1-215-432-00	METAL	3K	1%	1/4W	
R121	1-215-475-00	METAL	180K	1%	1/4W	
R122	1-215-475-00	METAL	180K	1%	1/4W	
R123	1-249-429-11	CARBON	10K	5%	1/4W	
R124	1-249-425-11	CARBON	4.7K	5%	1/4W	
R125	1-249-429-11	CARBON	10K	5%	1/4W	
R126	1-249-417-11	CARBON	1K	5%	1/4W	
R127	1-249-405-11	CARBON	100	5%	1/4W	
R128	1-249-405-11	CARBON	100	5%	1/4W	
R129	1-249-429-11	CARBON	10K	5%	1/4W	
R130	1-215-921-11	METAL OXIDE	4.7K	5%	3W	F
R131	1-215-921-11	METAL OXIDE	4.7K	5%	3W	F
R132	1-216-367-11	METAL OXIDE	0.68	5%	2W	F
R133	1-215-880-00	METAL OXIDE	10	5%	2W	F

REF.NO.	PART NO.	DESCRIPTION				REMARK
R136	1-249-417-11	CARBON	1K	5%	1/4W	
R137	1-249-417-11	CARBON	1K	5%	1/4W	
R138	1-249-401-11	CARBON	47	5%	1/4W	F

<TRANSFORMER>

T1	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T2	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE

<CRYSTAL>

X1	1-578-768-11	VIBLATOR, CERAMIC

****

*1-639-927-11 QM BOARD
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	*1-564-508-11	PLUG, CONNECTOR 5P
	*1-564-509-11	PLUG, CONNECTOR 6P
	*1-564-515-11	PLUG, CONNECTOR 12P
	*1-568-985-11	CONNECTOR, FEMALE 64P

<JACK>

J7	*1-526-575-00	SOCKET, PLUG 1P
J8	*1-526-575-00	SOCKET, PLUG 1P
J9	*1-526-575-00	SOCKET, PLUG 1P

****

*1-631-359-11 RC BOARD
****
(INCLUDING RCA,RCB,RCC,RCD BOARD)

*1-564-519-11 PLUG, CONNECTOR 4P

<CAPACITOR>

C1	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C2	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C3	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C4	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C5	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C6	1-123-306-00	ELECT	47MF	20%	6.3V

<DIODE>

D1	8-719-901-44	DIODE SLP144B
D4	8-719-801-48	DIODE 1SS193
D6	8-719-105-51	DIODE RD3.6M-B1

<IC>

IC1	8-759-062-72	IC M50461-164SP

<COIL>

L1	1-408-789-21	INDUCTOR CHIP 100UH

<TRANSISTOR>

Q1	8-729-230-46	TRANSISTOR 2SA1162-YG
Q2	8-729-230-49	TRANSISTOR 2SC2712-YG
Q5	8-729-230-49	TRANSISTOR 2SC2712-YG
Q6	8-729-230-46	TRANSISTOR 2SA1162-YG
Q7	8-729-230-49	TRANSISTOR 2SC2712-YG

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q8	8-729-101-07	TRANSISTOR 2SB798-DL	
Q9	8-729-230-49	TRANSISTOR 2SC2712-YG	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
R1	1-216-017-00	METAL GLAZE 47 5% 1/10W	
R2	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R3	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R4	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R5	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R6	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R10	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R11	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R12	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R13	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R14	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R15	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R16	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R17	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R18	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R19	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R20	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R21	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R22	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R23	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R24	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R25	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R26	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R27	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R28	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R29	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R30	1-216-028-00	METAL GLAZE 130 5% 1/10W	

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION	REMARK
S1	1-553-856-00	SWITCH, KEY BOARD	

<CRYSTAL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
X1	1-527-476-00	OSCILLATOR, CERAMIC	

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*1-631-356-11 RCA BOARD
`*********`

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D5	8-719-938-67	DIODE GL3EG8	
D6	8-719-938-67	DIODE GL3EG8	
D7	8-719-938-67	DIODE GL3EG8	
D8	8-719-938-67	DIODE GL3EG8	
D9	8-719-938-67	DIODE GL3EG8	

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*1-631-357-11 RCB BOARD
`*********`

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D10	8-719-938-67	DIODE GL3EG8	
D11	8-719-938-67	DIODE GL3EG8	
D12	8-719-938-67	DIODE GL3EG8	
D13	8-719-938-67	DIODE GL3EG8	
D14	8-719-938-67	DIODE GL3EG8	

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*1-631-358-11 RCC BOARD
`*********`

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D15	8-719-938-67	DIODE GL3EG8	
D16	8-719-938-67	DIODE GL3EG8	

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*1-631-493-11 RCD BOARD
`*********`

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D1	8-719-938-67	DIODE GL3EG8	

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*1-639-929-11 CFB BOARD
`*********`

REF.NO.	PART NO.	DESCRIPTION	REMARK
	*1-564-505-11	PLUG, CONNECTOR 2P	
	*1-564-507-11	PLUG, CONNECTOR 4P	
	*1-564-514-11	PLUG, CONNECTOR 11P	
	*1-564-519-11	PLUG, CONNECTOR 4P	
	*1-564-528-11	PLUG, CONNECTOR 13P	

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
C201	1-101-821-00	CERAMIC 0.0022MF 500V	
C202	1-101-821-00	CERAMIC 0.0022MF 500V	
C203	1-101-821-00	CERAMIC 0.0022MF 500V	
C204	1-101-821-00	CERAMIC 0.0022MF 500V	
C205	1-101-821-00	CERAMIC 0.0022MF 500V	

<FILTER>

REF.NO.	PART NO.	DESCRIPTION	REMARK
FL201	1-236-071-11	ENCAPSULATED COMPONENT	
FL202	1-236-164-11	ENCAPSULATED COMPONENT	
FL203	1-236-071-11	ENCAPSULATED COMPONENT	
FL204	1-236-071-11	ENCAPSULATED COMPONENT	
FL205	1-236-071-11	ENCAPSULATED COMPONENT	
FL206	1-236-071-11	ENCAPSULATED COMPONENT	
FL207	1-236-164-11	ENCAPSULATED COMPONENT	
FL208	1-236-164-11	ENCAPSULATED COMPONENT	
FL209	1-236-164-11	ENCAPSULATED COMPONENT	
FL210	1-236-164-11	ENCAPSULATED COMPONENT	

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*1-639-928-11 CFA BOARD
`*********`

REF.NO.	PART NO.	DESCRIPTION	REMARK
	*1-575-136-11	CONNECTOR ASS'Y, FLAT CABLE	

<FILTER>

REF.NO.	PART NO.	DESCRIPTION	REMARK
FL1	1-236-164-11	ENCAPSULATED COMPONENT	
FL2	1-236-164-11	ENCAPSULATED COMPONENT	
FL3	1-236-164-11	ENCAPSULATED COMPONENT	
FL4	1-236-101-11	ENCAPSULATED COMPONENT	
FL5	1-236-164-11	ENCAPSULATED COMPONENT	
FL6	1-236-101-11	ENCAPSULATED COMPONENT	
FL7	1-236-164-11	ENCAPSULATED COMPONENT	
FL8	1-236-101-11	ENCAPSULATED COMPONENT	
FL9	1-236-164-11	ENCAPSULATED COMPONENT	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION				REMARK
FL10	1-236-164-11	ENCAPSULATED COMPONENT				
FL11	1-236-164-11	ENCAPSULATED COMPONENT				
FL12	1-236-164-11	ENCAPSULATED COMPONENT				
FL13	1-236-164-11	ENCAPSULATED COMPONENT				
FL14	1-236-164-11	ENCAPSULATED COMPONENT				
FL15	1-236-164-11	ENCAPSULATED COMPONENT				
FL16	1-236-164-11	ENCAPSULATED COMPONENT				
FL17	1-236-164-11	ENCAPSULATED COMPONENT				
FL18	1-236-164-11	ENCAPSULATED COMPONENT				
FL19	1-236-164-11	ENCAPSULATED COMPONENT				
FL20	1-236-164-11	ENCAPSULATED COMPONENT				
FL21	1-236-164-11	ENCAPSULATED COMPONENT				
FL22	1-236-101-11	ENCAPSULATED COMPONENT				
FL23	1-236-101-11	ENCAPSULATED COMPONENT				
FL24	1-236-164-11	ENCAPSULATED COMPONENT				

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REF.NO.	PART NO.	DESCRIPTION				REMARK
	*1-639-946-11	CBR BOARD *********				
	*1-506-371-00	PIN, CONNECTOR 2P				
	*1-508-784-00	PIN, CONNECTOR (5MM PITCH) 1P				
	⚠.1-526-812-12	SOCKET, PICTURE TUBE				
	*1-564-507-11	PLUG, CONNECTOR 4P				
	1-575-098-11	LEAD ASS'Y, SIELD HIGH VOLTAGE				
		<CAPACITOR>				
C301	1-162-114-00	CERAMIC	0.0047MF			2KV
		<COIL>				
L303	1-408-401-00	INDUCTOR	2.2UH			
		<NEON LAMP>				
NL301	1-519-423-11	LAMP, NEON				
NL302	1-519-423-11	LAMP, NEON				
NL303	1-519-368-21	LAMP, NEON				
NL304	1-519-368-21	LAMP, NEON				
NL305	1-519-423-11	LAMP, NEON				
		<RESISTOR>				
R301	1-202-818-00	SOLID	1K	10%	1/2W	
R302	1-202-818-00	SOLID	1K	10%	1/2W	
R303	1-202-823-11	SOLID	2.7K	10%	1/2W	
R306	1-202-838-00	SOLID	100K	10%	1/2W	
R307	1-202-535-00	SOLID	27	10%	1/2W	
R308	1-202-525-00	SOLID	10	10%	1/2W	
R309	1-202-832-00	SOLID	15K	10%	1/2W	
		<SPARK GAP>				
SG301	1-519-063-XX	DISCHARGING GAP				

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REF.NO.	PART NO.	DESCRIPTION				REMARK
	*1-639-947-11	CBG BOARD *********				
	*1-506-371-00	PIN, CONNECTOR 2P				
	*1-508-784-00	PIN, CONNECTOR (5MM PITCH) 1P				
	⚠.1-526-812-12	SOCKET, PICTURE TUBE				
	*1-564-507-11	PLUG, CONNECTOR 4P				
	1-575-097-11	LEAD ASS'Y, SIELD HIGH VOLTAGE				
		<CAPACITOR>				
C401	1-162-114-00	CERAMIC	0.0047MF			2KV
		<COIL>				
L403	1-408-401-00	INDUCTOR	2.2UH			
		<NEON LAMP>				
NL401	1-519-423-11	LAMP, NEON				
NL402	1-519-423-11	LAMP, NEON				
NL403	1-519-368-21	LAMP, NEON				
NL404	1-519-368-21	LAMP, NEON				
NL405	1-519-423-11	LAMP, NEON				
		<RESISTOR>				
R401	1-202-818-00	SOLID	1K	10%	1/2W	
R402	1-202-818-00	SOLID	1K	10%	1/2W	
R403	1-202-823-11	SOLID	2.7K	10%	1/2W	
R406	1-202-838-00	SOLID	100K	10%	1/2W	
R407	1-202-535-00	SOLID	27	10%	1/2W	
R408	1-202-525-00	SOLID	10	10%	1/2W	
R409	1-202-832-00	SOLID	15K	10%	1/2W	
		<SPARK GAP>				
SG401	1-519-063-XX	DISCHARGING GAP				

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REF.NO.	PART NO.	DESCRIPTION				REMARK
	*1-639-948-11	CBB BOARD *********				
	*1-506-371-00	PIN, CONNECTOR 2P				
	*1-508-784-00	PIN, CONNECTOR (5MM PITCH) 1P				
	⚠.1-526-812-12	SOCKET, PICTURE TUBE				
	*1-564-507-11	PLUG, CONNECTOR 4P				
	1-575-096-11	LEAD ASS'Y, SIELD HIGH VOLTAGE				
		<CAPACITOR>				
C501	1-162-114-00	CERAMIC	0.0047MF			2KV
		<COIL>				
L503	1-408-401-00	INDUCTOR	2.2UH			
		<NEON LAMP>				
NL501	1-519-423-11	LAMP, NEON				
NL502	1-519-423-11	LAMP, NEON				
NL503	1-519-368-21	LAMP, NEON				
NL504	1-519-368-21	LAMP, NEON				
NL505	1-519-423-11	LAMP, NEON				
		<RESISTOR>				
R501	1-202-818-00	SOLID	1K	10%	1/2W	
R502	1-202-818-00	SOLID	1K	10%	1/2W	
R503	1-202-823-11	SOLID	2.7K	10%	1/2W	
R506	1-202-838-00	SOLID	100K	10%	1/2W	
R507	1-202-535-00	SOLID	27	10%	1/2W	
R508	1-202-525-00	SOLID	10	10%	1/2W	

CBB CA(RG)

REF.NO.	PART NO.	DESCRIPTION			REMARK
R509	1-202-832-00	SOLID	15K	10%	1/2W

<SPARK GAP>

REF.NO.	PART NO.	DESCRIPTION
SG501	1-519-063-XX	DISCHARGING GAP

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*A-1335-032-A CA (RG) BOARD, COMPLETE
****

REF.NO.	PART NO.	DESCRIPTION
	*1-526-575-00	SOCKET, PLUG 1P
	*1-564-507-11	PLUG, CONNECTOR 4P
	*1-564-514-11	PLUG, CONNECTOR 11P
	*1-564-515-11	PLUG, CONNECTOR 12P
	*1-564-516-11	PLUG, CONNECTOR 13P
	*1-568-979-11	CONNECTOR 30P
	*4-363-404-00	HOLDER, IC
	4-382-854-11	SCREW (M3X10), P, SW (+)

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C1	1-124-907-11	ELECT	10MF	20%	50V
C2	1-126-101-11	ELECT	100MF	20%	16V
C3	1-124-907-11	ELECT	10MF	20%	50V
C4	1-126-101-11	ELECT	100MF	20%	16V
C5	1-126-233-11	ELECT	22MF	20%	50V
C6	1-126-101-11	ELECT	100MF	20%	16V
C7	1-126-233-11	ELECT	22MF	20%	50V
C8	1-102-820-00	CERAMIC	330PF	5%	50V
C9	1-101-880-00	CERAMIC	47PF	5%	50V
C10	1-101-004-00	CERAMIC	0.01MF		50V
C11	1-101-004-00	CERAMIC	0.01MF		50V
C12	1-101-004-00	CERAMIC	0.01MF		50V
C13	1-101-004-00	CERAMIC	0.01MF		50V
C14	1-126-233-11	ELECT	22MF	20%	50V
C16	1-126-233-11	ELECT	22MF	20%	50V
C17	1-136-165-00	FILM	0.1MF	5%	50V
C18	1-136-165-00	FILM	0.1MF	5%	50V
C19	1-136-165-00	FILM	0.1MF	5%	50V
C20	1-136-165-00	FILM	0.1MF	5%	50V
C21	1-126-233-11	ELECT	22MF	20%	50V
C22	1-126-103-11	ELECT	470MF	20%	16V
C23	1-136-171-00	FILM	0.33MF	5%	50V
C24	1-102-038-00	CERAMIC	0.001MF		500V
C25	1-124-907-11	ELECT	10MF	20%	50V
C26	1-126-101-11	ELECT	100MF	20%	16V
C101	1-124-282-00	ELECT	22MF	20%	16V
C102	1-124-477-11	ELECT	47MF	20%	16V
C103	1-126-101-11	ELECT	100MF	20%	16V
C104	1-126-101-11	ELECT	100MF	20%	16V
C105	1-126-233-11	ELECT	22MF	20%	50V
C106	1-102-973-00	CERAMIC	100PF	5%	50V
C107	1-102-976-00	CERAMIC	180PF	5%	50V
C110	1-124-798-11	ELECT	1MF	20%	160V
C111	1-126-233-11	ELECT	22MF	20%	50V
C112	1-136-165-00	FILM	0.1MF	5%	50V
C113	1-136-165-00	FILM	0.1MF	5%	50V
C114	1-126-174-51	ELECT	10MF	20%	350V
C115	1-102-038-00	CERAMIC	0.001MF		500V
C116	1-102-050-00	CERAMIC	0.01MF	99%	500V
C117	1-124-768-11	ELECT	4.7MF	20%	50V
C118	1-101-004-00	CERAMIC	0.01MF		50V
C119	1-136-165-00	FILM	0.1MF	5%	50V
C120	1-124-903-11	ELECT	1MF	20%	50V
C121	1-126-233-11	ELECT	22MF	20%	50V
C122	1-126-233-11	ELECT	22MF	20%	50V
C123	1-102-050-00	CERAMIC	0.01MF	99%	500V
C125	1-126-233-11	ELECT	22MF	20%	50V
C126	1-101-004-00	CERAMIC	0.01MF		50V
C127	1-101-004-00	CERAMIC	0.01MF		50V
C201	1-124-282-00	ELECT	22MF	20%	16V
C202	1-126-233-11	ELECT	22MF	20%	50V
C203	1-126-101-11	ELECT	100MF	20%	16V
C204	1-126-101-11	ELECT	100MF	20%	16V
C205	1-126-233-11	ELECT	22MF	20%	50V
C206	1-102-973-00	CERAMIC	100PF	5%	50V
C207	1-102-976-00	CERAMIC	180PF	5%	50V
C210	1-124-798-11	ELECT	1MF	20%	160V
C211	1-126-233-11	ELECT	22MF	20%	50V
C212	1-136-165-00	FILM	0.1MF	5%	50V
C213	1-136-165-00	FILM	0.1MF	5%	50V
C214	1-126-174-51	ELECT	10MF	20%	350V
C215	1-102-038-00	CERAMIC	0.001MF		500V
C216	1-102-050-00	CERAMIC	0.01MF	99%	500V
C217	1-124-768-11	ELECT	4.7MF	20%	50V
C218	1-101-004-00	CERAMIC	0.01MF		50V
C219	1-136-165-00	FILM	0.1MF	5%	50V
C220	1-124-903-11	ELECT	1MF	20%	50V
C221	1-126-233-11	ELECT	22MF	20%	50V
C222	1-126-233-11	ELECT	22MF	20%	50V
C223	1-102-050-00	CERAMIC	0.01MF	99%	500V
C225	1-126-233-11	ELECT	22MF	20%	50V
C226	1-101-004-00	CERAMIC	0.01MF		50V
C227	1-101-004-00	CERAMIC	0.01MF		50V

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-900-95	DIODE V09G
D2	8-719-900-95	DIODE V09G
D3	8-719-109-85	DIODE RD5.1ES-B2
D4	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D9	8-719-109-97	DIODE RD6.8ES-B2
D12	8-719-911-19	DIODE 1SS119
D13	8-719-109-85	DIODE RD5.1ES-B2
D14	8-719-109-97	DIODE RD6.8ES-B2
D15	8-719-911-19	DIODE 1SS119
D101	8-719-901-83	DIODE 1SS83
D103	8-719-911-19	DIODE 1SS119
D104	8-719-911-19	DIODE 1SS119
D105	8-719-901-83	DIODE 1SS83
D106	8-719-911-19	DIODE 1SS119
D107	8-719-911-19	DIODE 1SS119
D109	8-719-911-19	DIODE 1SS119
D110	8-719-109-51	DIODE RD2.0ES-B2
D111	8-719-911-19	DIODE 1SS119
D112	8-719-911-19	DIODE 1SS119
D113	8-719-911-19	DIODE 1SS119
D114	8-719-110-36	DIODE RD13ES-B2
D115	8-719-911-19	DIODE 1SS119
D117	8-719-911-19	DIODE 1SS119
D118	8-719-911-19	DIODE 1SS119
D120	8-719-911-19	DIODE 1SS119
D121	8-719-911-19	DIODE 1SS119
D122	8-719-911-19	DIODE 1SS119
D123	8-719-911-19	DIODE 1SS119
D201	8-719-901-83	DIODE 1SS83
D203	8-719-911-19	DIODE 1SS119
D204	8-719-911-19	DIODE 1SS119
D205	8-719-901-83	DIODE 1SS83

CA(RG)

REF.NO.	PART NO.	DESCRIPTION	REMARK
D206	8-719-911-19	DIODE 1SS119	
D207	8-719-911-19	DIODE 1SS119	
D209	8-719-911-19	DIODE 1SS119	
D210	8-719-109-51	DIODE RD2.0ES-B2	
D211	8-719-911-19	DIODE 1SS119	
D212	8-719-911-19	DIODE 1SS119	
D213	8-719-911-19	DIODE 1SS119	
D214	8-719-110-36	DIODE RD13ES-B2	
D217	8-719-911-19	DIODE 1SS119	
D218	8-719-911-19	DIODE 1SS119	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC1	8-759-929-65	IC LM7912CT	
IC2	8-759-929-62	IC LM7812CT	
IC3	8-759-982-21	IC RC78L05A	
IC4	8-759-000-01	IC MC74HC4538N	
IC5	8-759-984-55	IC MB675429	
IC6	8-759-916-71	IC SN74HC244AN	
IC7	8-759-032-74	IC MC74HC00AN	
IC8	8-759-990-82	IC TL082CP	
IC101	8-749-922-43	IC VPH05A	
IC102	8-759-990-82	IC TL082CP	
IC104	8-749-923-15	IC TY885002A	
IC201	8-749-922-43	IC VPH05A	
IC202	8-759-990-82	IC TL082CP	
IC204	8-749-923-15	IC TY885002A	

<COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
L101	1-408-879-21	INDUCTOR 0.47UH	
L201	1-408-879-21	INDUCTOR 0.47UH	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q2	8-729-900-89	TRANSISTOR DTC144ES	
Q3	8-729-900-89	TRANSISTOR DTC144ES	
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q5	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q8	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q9	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q11	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q12	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q19	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q101	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q102	8-729-140-50	TRANSISTOR 2SC3209LK	
Q103	8-729-801-88	TRANSISTOR 2SA1381-E	
Q104	8-729-801-88	TRANSISTOR 2SA1381-E	
Q105	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q106	8-729-140-50	TRANSISTOR 2SC3209LK	
Q107	8-729-801-88	TRANSISTOR 2SA1381-E	
Q108	8-729-900-65	TRANSISTOR DTA144ES	
Q109	8-729-900-65	TRANSISTOR DTA144ES	
Q110	8-729-900-89	TRANSISTOR DTC144ES	
Q111	8-729-105-74	TRANSISTOR 2SK523-M1	
Q112	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q113	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q115	8-729-801-88	TRANSISTOR 2SA1381-E	
Q201	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q202	8-729-140-50	TRANSISTOR 2SC3209LK	
Q203	8-729-801-88	TRANSISTOR 2SA1381-E	
Q204	8-729-801-88	TRANSISTOR 2SA1381-E	
Q205	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q206	8-729-140-50	TRANSISTOR 2SC3209LK	
Q207	8-729-801-88	TRANSISTOR 2SA1381-E	
Q208	8-729-900-65	TRANSISTOR DTA144ES	
Q209	8-729-900-65	TRANSISTOR DTA144ES	
Q210	8-729-900-89	TRANSISTOR DTC144ES	
Q211	8-729-105-74	TRANSISTOR 2SK523-M1	
Q212	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q215	8-729-801-88	TRANSISTOR 2SA1381-E	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-249-405-11	CARBON	100	5%	1/4W	
R2	1-215-437-00	METAL	4.7K	1%	1/4W	
R3	1-249-441-11	CARBON	100K	5%	1/4W	
R4	1-215-449-00	METAL	15K	1%	1/4W	
R5	1-249-405-11	CARBON	100	5%	1/4W	
R6	1-249-438-11	CARBON	56K	5%	1/4W	
R7	1-249-437-11	CARBON	47K	5%	1/4W	
R8	1-249-405-11	CARBON	100	5%	1/4W	
R9	1-215-449-00	METAL	15K	1%	1/4W	
R10	1-215-447-00	METAL	12K	1%	1/4W	
R11	1-249-405-11	CARBON	100	5%	1/4W	
R12	1-249-405-11	CARBON	100	5%	1/4W	
R14	1-249-427-11	CARBON	6.8K	5%	1/4W	
R16	1-249-405-11	CARBON	100	5%	1/4W	
R17	1-249-423-11	CARBON	3.3K	5%	1/4W	
R18	1-249-426-11	CARBON	5.6K	5%	1/4W	
R22	1-215-443-00	METAL	8.2K	1%	1/4W	
R23	1-215-447-00	METAL	12K	1%	1/4W	
R24	1-215-453-00	METAL	22K	1%	1/4W	
R25	1-215-457-00	METAL	33K	1%	1/4W	
R26	1-249-405-11	CARBON	100	5%	1/4W	
R27	1-249-405-11	CARBON	100	5%	1/4W	
R28	1-215-431-00	METAL	2.7K	1%	1/4W	
R29	1-249-429-11	CARBON	10K	5%	1/4W	
R30	1-215-469-00	METAL	100K	1%	1/4W	
R31	1-249-429-11	CARBON	10K	5%	1/4W	
R32	1-215-443-00	METAL	8.2K	1%	1/4W	
R33	1-215-443-00	METAL	8.2K	1%	1/4W	
R34	1-215-443-00	METAL	8.2K	1%	1/4W	
R35	1-247-887-00	CARBON	220K	5%	1/4W	
R36	1-247-887-00	CARBON	220K	5%	1/4W	
R37	1-247-887-00	CARBON	220K	5%	1/4W	
R38	1-249-441-11	CARBON	100K	5%	1/4W	
R39	1-215-469-00	METAL	100K	1%	1/4W	
R40	1-249-433-11	CARBON	22K	5%	1/4W	
R41	1-215-473-00	METAL	150K	1%	1/4W	
R42	1-249-433-11	CARBON	22K	5%	1/4W	
R43	1-249-405-11	CARBON	100	5%	1/4W	
R44	1-249-429-11	CARBON	10K	5%	1/4W	
R45	1-249-429-11	CARBON	10K	5%	1/4W	
R46	1-247-887-00	CARBON	220K	5%	1/4W	
R47	1-249-413-11	CARBON	470	5%	1/4W	
R48	1-249-439-11	CARBON	68K	5%	1/4W	
R101	1-215-401-11	METAL	150	1%	1/4W	

CA(RG) CA(B)

REF.NO.	PART NO.	DESCRIPTION				REMARK
R102	1-215-401-11	METAL	150	1%	1/4W	
R103	1-215-473-00	METAL	150K	1%	1/4W	
R105	1-215-469-00	METAL	100K	1%	1/4W	
R106	1-215-465-00	METAL	68K	1%	1/4W	
R107	1-249-421-11	CARBON	2.2K	5%	1/4W	
R108	1-249-403-11	CARBON	68	5%	1/4W	F
R109	1-215-429-00	METAL	2.2K	1%	1/4W	
R110	1-249-413-11	CARBON	470	5%	1/4W	F
R111	1-249-421-11	CARBON	2.2K	5%	1/4W	
R112	1-215-383-00	METAL	27	1%	1/4W	
R117	1-249-421-11	CARBON	2.2K	5%	1/4W	
R118	1-215-447-00	METAL	12K	1%	1/4W	
R119	1-215-433-00	METAL	3.3K	1%	1/4W	
R120	1-215-433-00	METAL	3.3K	1%	1/4W	
R122	1-215-441-00	METAL	6.8K	1%	1/4W	
R123	1-215-481-00	METAL	330K	1%	1/4W	
R124	1-215-433-00	METAL	3.3K	1%	1/4W	
R125	1-249-431-11	CARBON	15K	5%	1/4W	
R126	1-249-431-11	CARBON	15K	5%	1/4W	
R127	1-249-415-11	CARBON	680	5%	1/4W	
R128	1-249-405-11	CARBON	100	5%	1/4W	
R129	1-249-414-11	CARBON	560	5%	1/4W	F
R130	1-215-431-00	METAL	2.7K	1%	1/4W	
R131	1-202-549-00	SOLID	100	10%	1/2W	
R132	1-202-549-00	SOLID	100	10%	1/2W	
R133	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R134	1-249-429-11	CARBON	10K	5%	1/4W	
R135	1-215-469-00	METAL	100K	1%	1/4W	
R136	1-214-777-00	METAL	100K	1%	1/4W	
R137	1-215-445-00	METAL	10K	1%	1/4W	
R138	1-215-451-00	METAL	18K	1%	1/4W	
R139	1-249-421-11	CARBON	2.2K	5%	1/4W	
R140	1-215-453-00	METAL	22K	1%	1/4W	
R141	1-215-421-00	METAL	1K	1%	1/4W	
R142	1-249-417-11	CARBON	1K	5%	1/4W	
R143	1-247-903-00	CARBON	1M	5%	1/4W	
R144	1-249-427-11	CARBON	6.8K	5%	1/4W	
R145	1-249-405-11	CARBON	100	5%	1/4W	
R147	1-215-457-00	METAL	33K	1%	1/4W	
R148	1-249-410-11	CARBON	270	5%	1/4W	F
R149	1-249-405-11	CARBON	100	5%	1/4W	
R150	1-249-405-11	CARBON	100	5%	1/4W	
R160	1-249-423-11	CARBON	3. 3K	5%	1/4W	
R201	1-215-401-11	METAL	150	1%	1/4W	
R202	1-215-401-11	METAL	150	1%	1/4W	
R203	1-215-461-00	METAL	47K	1%	1/4W	
R204	1-215-469-00	METAL	100K	1%	1/4W	
R205	1-215-469-00	METAL	100K	1%	1/4W	
R206	1-215-471-00	METAL	120K	1%	1/4W	
R207	1-249-421-11	CARBON	2.2K	5%	1/4W	
R208	1-249-403-11	CARBON	68	5%	1/4W	F
R209	1-215-429-00	METAL	2.2K	1%	1/4W	
R210	1-249-410-11	CARBON	270	5%	1/4W	F
R211	1-249-421-11	CARBON	2.2K	5%	1/4W	
R212	1-215-383-00	METAL	27	1%	1/4W	
R217	1-249-421-11	CARBON	2.2K	5%	1/4W	
R218	1-215-447-00	METAL	12K	1%	1/4W	
R219	1-215-433-00	METAL	3.3K	1%	1/4W	
R220	1-215-433-00	METAL	3.3K	1%	1/4W	
R222	1-215-441-00	METAL	6.8K	1%	1/4W	
R223	1-215-481-00	METAL	330K	1%	1/4W	
R224	1-215-433-00	METAL	3.3K	1%	1/4W	
R225	1-249-431-11	CARBON	15K	5%	1/4W	
R226	1-249-431-11	CARBON	15K	5%	1/4W	
R227	1-249-415-11	CARBON	680	5%	1/4W	
R228	1-249-405-11	CARBON	100	5%	1/4W	
R229	1-249-414-11	CARBON	560	5%	1/4W	F
R230	1-215-431-00	METAL	2.7K	1%	1/4W	
R231	1-202-549-00	SOLID	100	10%	1/2W	
R232	1-202-549-00	SOLID	100	10%	1/2W	
R233	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R234	1-215-469-00	METAL	100K	1%	1/4W	
R235	1-249-429-11	CARBON	10K	5%	1/4W	
R236	1-214-777-00	METAL	100K	1%	1/4W	
R237	1-215-445-00	METAL	10K	1%	1/4W	
R238	1-215-451-00	METAL	18K	1%	1/4W	
R239	1-249-421-11	CARBON	2.2K	5%	1/4W	
R240	1-215-453-00	METAL	22K	1%	1/4W	
R241	1-215-421-00	METAL	1K	1%	1/4W	
R242	1-249-417-11	CARBON	1K	5%	1/4W	
R243	1-247-903-00	CARBON	1M	5%	1/4W	
R244	1-249-427-11	CARBON	6.8K	5%	1/4W	
R245	1-249-405-11	CARBON	100	5%	1/4W	
R247	1-249-405-11	CARBON	100	5%	1/4W	
R248	1-249-405-11	CARBON	100	5%	1/4W	
R260	1-249-423-11	CARBON	3. 3K	5%	1/4W	

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*A-1335-033-A CA (B) BOARD, COMPLETE
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*1-526-575-00	SOCKET, PLUG 1P	
*1-564-507-11	PLUG, CONNECTOR 4P	
*1-564-516-11	PLUG, CONNECTOR 13P	

<CAPACITOR>

C30	1-126-101-11	ELECT	100MF	20%	16V
C31	1-126-101-11	ELECT	100MF	20%	16V
C32	1-126-233-11	ELECT	22MF	20%	50V
C33	1-126-233-11	ELECT	22MF	20%	50V
C34	1-101-004-00	CERAMIC	0.01MF		50V
C35	1-124-903-11	ELECT	1MF	20%	50V
C36	1-124-903-11	ELECT	1MF	20%	50V
C37	1-126-233-11	ELECT	22MF	20%	50V
C38	1-101-004-00	CERAMIC	0.01MF		50V
C42	1-162-117-00	CERAMIC	100PF	10%	500V
C43	1-101-004-00	CERAMIC	0.01MF		50V
C44	1-124-798-11	ELECT	1MF	20%	160V
C45	1-101-004-00	CERAMIC	0.01MF		50V
C46	1-126-233-11	ELECT	22MF	20%	50V
C47	1-126-134-11	ELECT	4.7MF	20%	350V
C48	1-123-932-00	ELECT	4.7MF	20%	160V
C50	1-124-798-11	ELECT	1MF	20%	160V
C51	1-102-050-00	CERAMIC	0.01MF	99%	500V
C52	1-102-050-00	CERAMIC	0.01MF	99%	500V
C54	1-124-798-11	ELECT	1MF	20%	160V
C55	1-126-233-11	ELECT	22MF	20%	50V
C56	1-124-903-11	ELECT	1MF	20%	50V
C57	1-124-903-11	ELECT	1MF	20%	50V
C58	1-101-004-00	CERAMIC	0.01MF		50V
C301	1-124-282-00	ELECT	22MF	20%	16V
C302	1-124-910-11	ELECT	47MF	20%	50V
C303	1-126-101-11	ELECT	100MF	20%	16V
C304	1-126-101-11	ELECT	100MF	20%	16V
C305	1-126-233-11	ELECT	22MF	20%	50V
C306	1-102-973-00	CERAMIC	100PF	5%	50V
C307	1-102-976-00	CERAMIC	180PF	5%	50V
C310	1-124-798-11	ELECT	1MF	20%	160V
C311	1-126-233-11	ELECT	22MF	20%	50V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C312	1-136-165-00	FILM	0.1MF	5%	50V
C313	1-136-165-00	FILM	0.1MF	5%	50V
C314	1-126-174-51	ELECT	10MF	20%	350V
C315	1-102-038-00	CERAMIC	0.001MF		500V
C316	1-102-050-00	CERAMIC	0.01MF	99%	500V
C317	1-124-768-11	ELECT	4.7MF	20%	50V
C318	1-101-004-00	CERAMIC	0.01MF		50V
C319	1-136-165-00	FILM	0.1MF	5%	50V
C320	1-124-903-11	ELECT	1MF	20%	50V
C321	1-126-233-11	ELECT	22MF	20%	50V
C322	1-126-233-11	ELECT	22MF	20%	50V
C323	1-102-050-00	CERAMIC	0.01MF	99%	500V
C324	1-102-973-00	CERAMIC	100PF	5%	50V
C325	1-126-233-11	ELECT	22MF	20%	50V
C326	1-101-004-00	CERAMIC	0.01MF		50V
C327	1-101-004-00	CERAMIC	0.01MF		50V
C350	1-126-101-11	ELECT	100MF	20%	16V
C351	1-126-101-11	ELECT	100MF	20%	16V
		<DIODE>			
D30	8-719-109-66	DIODE RD3.3ES-B2			
D31	8-719-901-83	DIODE 1SS83			
D32	8-719-901-83	DIODE 1SS83			
D33	8-719-110-31	DIODE RD12ES-B2			
D34	8-719-110-31	DIODE RD12ES-B2			
D35	8-719-900-95	DIODE V09G			
D36	8-719-900-95	DIODE V09G			
D40	8-719-900-95	DIODE V09G			
D41	8-719-911-19	DIODE 1SS119			
D301	8-719-901-83	DIODE 1SS83			
D303	8-719-911-19	DIODE 1SS119			
D304	8-719-911-19	DIODE 1SS119			
D305	8-719-901-83	DIODE 1SS83			
D306	8-719-911-19	DIODE 1SS119			
D307	8-719-911-19	DIODE 1SS119			
D309	8-719-911-19	DIODE 1SS119			
D310	8-719-109-51	DIODE RD2.0ES-B2			
D311	8-719-911-19	DIODE 1SS119			
D312	8-719-911-19	DIODE 1SS119			
D313	8-719-911-19	DIODE 1SS119			
D314	8-719-110-36	DIODE RD13ES-B2			
D315	8-719-109-66	DIODE RD3.3ES-B2			
D316	8-719-911-19	DIODE 1SS119			
D317	8-719-911-19	DIODE 1SS119			
D318	8-719-911-19	DIODE 1SS119			
		<IC>			
IC301	8-749-922-43	IC VPH05A			
IC302	8-759-990-82	IC TL082CP			
IC304	8-749-923-15	IC TY885002A			
IC305	8-749-923-25	IC TY911504			
		<COIL>			
L301	1-408-879-21	INDUCTOR	0.47UH		
		<TRANSISTOR>			
Q30	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q31	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q32	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q33	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q34	8-729-119-78	TRANSISTOR 2SC2785-HFE			

REF.NO.	PART NO.	DESCRIPTION				REMARK
Q35	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q36	8-729-820-82	TRANSISTOR 2SA1208-S				
Q37	8-729-820-82	TRANSISTOR 2SA1208-S				
Q38	8-729-255-12	TRANSISTOR 2SC2551-0				
Q41	8-729-903-68	TRANSISTOR 2SD982				
Q42	8-729-801-88	TRANSISTOR 2SA1381-E				
Q43	8-729-801-88	TRANSISTOR 2SA1381-E				
Q44	8-729-903-68	TRANSISTOR 2SD982				
Q45	8-729-140-50	TRANSISTOR 2SC3209LK				
Q301	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q302	8-729-140-50	TRANSISTOR 2SC3209LK				
Q303	8-729-801-88	TRANSISTOR 2SA1381-E				
Q304	8-729-801-88	TRANSISTOR 2SA1381-E				
Q305	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q306	8-729-140-50	TRANSISTOR 2SC3209LK				
Q307	8-729-801-88	TRANSISTOR 2SA1381-E				
Q308	8-729-900-65	TRANSISTOR DTA144ES				
Q309	8-729-900-65	TRANSISTOR DTA144ES				
Q310	8-729-900-89	TRANSISTOR DTC144ES				
Q311	8-729-105-74	TRANSISTOR 2SK523-M1				
Q312	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q313	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q314	8-729-900-89	TRANSISTOR DTC144ES				
Q315	8-729-801-88	TRANSISTOR 2SA1381-E				
		<TRANSISTOR>				
R50	1-249-421-11	CARBON	2.2K	5%	1/4W	
R51	1-249-424-11	CARBON	3.9K	5%	1/4W	
R52	1-249-393-11	CARBON	10	5%	1/4W	
R53	1-249-424-11	CARBON	3.9K	5%	1/4W	
R54	1-215-437-00	METAL	4.7K	1%	1/4W	
R55	1-215-439-00	METAL	5.6K	1%	1/4W	
R56	1-215-467-00	METAL	82K	1%	1/4W	
R57	1-249-405-11	CARBON	100	5%	1/4W	
R58	1-249-405-11	CARBON	100	5%	1/4W	
R59	1-249-423-11	CARBON	3.3K	5%	1/4W	
R60	1-249-405-11	CARBON	100	5%	1/4W	
R61	1-249-423-11	CARBON	3.3K	5%	1/4W	
R62	1-249-425-11	CARBON	4.7K	5%	1/4W	
R63	1-249-437-11	CARBON	47K	5%	1/4W	
R65	1-249-425-11	CARBON	4.7K	5%	1/4W	
R66	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R67	1-249-397-11	CARBON	22	5%	1/4W	
R68	1-249-397-11	CARBON	22	5%	1/4W	F
R74	1-249-429-11	CARBON	10K	5%	1/4W	F
R75	1-249-429-11	CARBON	10K	5%	1/4W	F
R76	1-202-719-00	SOLID	1M	10%	1/2W	
R77	1-247-903-00	CARBON	1M	5%	1/4W	
R79	1-249-397-11	CARBON	22	5%	1/4W	F
R80	1-249-437-11	CARBON	47K	5%	1/4W	
R81	1-249-441-11	CARBON	100K	5%	1/4W	
R82	1-249-437-11	CARBON	47K	5%	1/4W	
R83	1-249-435-11	CARBON	33K	5%	1/4W	
R84	1-249-476-11	CARBON	1.5	5%	1/2W	F
R85	1-249-433-11	CARBON	22K	5%	1/4W	
R86	1-247-903-00	CARBON	1M	5%	1/4W	
R87	1-249-425-11	CARBON	4.7K	5%	1/4W	
R301	1-215-401-11	METAL	150	1%	1/4W	
R302	1-215-401-11	METAL	150	1%	1/4W	
R303	1-215-461-00	METAL	47K	1%	1/4W	
R304	1-215-469-00	METAL	100K	1%	1/4W	
R305	1-215-469-00	METAL	100K	1%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R306	1-215-473-00	METAL	150K	1%	1/4W	
R307	1-249-421-11	CARBON	2.2K	5%	1/4W	
R308	1-249-403-11	CARBON	68	5%	1/4W	
R309	1-215-429-00	METAL	2.2K	1%	1/4W	
R310	1-249-407-11	CARBON	150	5%	1/4W	F
R311	1-249-421-11	CARBON	2.2K	5%	1/4W	
R312	1-215-383-00	METAL	27	1%	1/4W	
R317	1-249-421-11	CARBON	2.2K	5%	1/4W	
R318	1-215-447-00	METAL	12K	1%	1/4W	
R319	1-215-433-00	METAL	3.3K	1%	1/4W	
R320	1-215-433-00	METAL	3.3K	1%	1/4W	
R322	1-215-441-00	METAL	6.8K	1%	1/4W	
R323	1-215-481-00	METAL	330K	1%	1/4W	
R324	1-215-433-00	METAL	3.3K	1%	1/4W	
R325	1-249-431-11	CARBON	15K	5%	1/4W	
R326	1-249-431-11	CARBON	15K	5%	1/4W	
R327	1-249-415-11	CARBON	680	5%	1/4W	
R328	1-249-405-11	CARBON	100	5%	1/4W	
R329	1-249-414-11	CARBON	560	5%	1/4W	F
R330	1-215-431-00	METAL	2.7K	1%	1/4W	
R331	1-202-549-00	SOLID	100	10%	1/2W	
R332	1-202-549-00	SOLID	100	10%	1/2W	
R333	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R334	1-215-469-00	METAL	100K	1%	1/4W	
R335	1-249-429-11	CARBON	10K	5%	1/4W	
R336	1-214-777-00	METAL	100K	1%	1/4W	
R337	1-215-445-00	METAL	10K	1%	1/4W	
R338	1-215-451-00	METAL	18K	1%	1/4W	
R339	1-249-421-11	CARBON	2.2K	5%	1/4W	
R340	1-215-453-00	METAL	22K	1%	1/4W	
R341	1-215-421-00	METAL	1K	1%	1/4W	
R342	1-249-417-11	CARBON	1K	5%	1/4W	
R343	1-247-903-00	CARBON	1M	5%	1/4W	
R344	1-249-427-11	CARBON	6.8K	5%	1/4W	
R345	1-249-405-11	CARBON	100	5%	1/4W	
R347	1-249-405-11	CARBON	100	5%	1/4W	
R348	1-247-903-00	CARBON	1M	5%	1/4W	
R349	1-249-423-11	CARBON	3.3K	5%	1/4W	
R350	1-249-405-11	CARBON	100	5%	1/4W	
R351	1-215-447-00	METAL	12K	1%	1/4W	
R352	1-249-421-11	CARBON	2.2K	5%	1/4W	
R353	1-249-403-11	CARBON	68	5%	1/4W	F
R356	1-215-457-00	METAL	33K	1%	1/4W	
R360	1-249-423-11	CARBON	3.3K	5%	1/4W	

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	*1-641-601-11	DF BOARD ********
	*1-568-984-11	CONNECTOR, MALE 96P

<RESISTOR>

R901	1-215-421-00	METAL	1K	1%	1/4W
R902	1-215-421-00	METAL	1K	1%	1/4W
R903	1-215-421-00	METAL	1K	1%	1/4W
R904	1-215-421-00	METAL	1K	1%	1/4W
R905	1-215-421-00	METAL	1K	1%	1/4W
R906	1-215-421-00	METAL	1K	1%	1/4W

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REF.NO.	PART NO.	DESCRIPTION	REMARK
	*1-641-634-11	DM BOARD ********	
	1-506-348-XX	PIN, CONNECTOR 4P	
	*1-506-348-XX	PIN, CONNECTOR 6P	
	1-506-348-XX	PIN, CONNECTOR 3P	
	1-506-348-XX	PIN, CONNECOTR 5P	
	*1-508-742-00	PIN, CONNECTOR 3P	
	*1-564-505-11	PLUG, CONNECTOR 2P	
	*1-564-507-11	PLUG, CONNECTOR 4P	
	*1-564-508-11	PLUG, CONNECTOR 5P	
	*1-564-509-11	PLUG, CONNECTOR 6P	
	*1-564-514-11	PLUG, CONNECTOR 11P	
	*1-564-515-11	PLUG, CONNECTOR 12P	
	*1-564-516-11	PLUG, CONNECTOR 13P	
	*1-568-982-11	CONNECTOR, FEMALE 96P	
	*1-568-985-11	CONNECTOR, FEMALE 64P	

<CAPACITOR>

C1	1-124-556-11	ELECT	2200MF	20%	16V
C2	1-124-556-11	ELECT	2200MF	20%	16V

<RESISTOR>

R1	1-215-908-00	METAL OXIDE	33	5%	3W	F
R2	1-215-908-00	METAL OXIDE	33	5%	3W	F
R3	1-216-483-11	METAL OXIDE	2.7K	5%	3W	F
R4	1-216-483-11	METAL OXIDE	2.7K	5%	3W	F
R5	1-216-475-11	METAL OXIDE	120	5%	3W	F

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	*A-1346-002-A	DA BOARD, COMPLETE *****************
	4-382-854-11	SCREW (M3X10), P, SW (+)

<CAPACITOR>

C1	1-124-907-11	ELECT	10MF	20%	50V
C2	1-126-101-11	ELECT	100MF	20%	16V
C3	1-124-907-11	ELECT	10MF	20%	50V
C4	1-126-101-11	ELECT	100MF	20%	16V
C5	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C6	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C7	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C8	1-124-903-11	ELECT	1MF	20%	50V
C9	1-136-153-00	FILM	0.01MF	5%	50V
C10	1-124-903-11	ELECT	1MF	20%	50V
C11	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C12	1-124-903-11	ELECT	1MF	20%	50V
C13	1-136-153-00	FILM	0.01MF	5%	50V
C14	1-124-907-11	ELECT	10MF	20%	50V
C15	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C16	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C17	1-136-165-00	FILM	0.1MF	5%	50V
C18	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C19	1-124-903-11	ELECT	1MF	20%	50V
C20	1-136-153-00	FILM	0.01MF	5%	50V
C21	1-124-903-11	ELECT	1MF	20%	50V
C22	1-124-925-11	ELECT	2.2MF	20%	50V
C23	1-124-907-11	ELECT	10MF	20%	50V
C24	1-124-907-11	ELECT	10MF	20%	50V
C25	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C26	1-124-903-11	ELECT	1MF	20%	50V
C27	1-136-153-00	FILM	0.01MF	5%	50V
C28	1-124-903-11	ELECT	1MF	20%	50V
C29	1-124-925-11	ELECT	2.2MF	20%	50V
C30	1-124-907-11	ELECT	10MF	20%	50V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C31	1-124-907-11	ELECT	10MF	20%	50V
C32	1-124-907-11	ELECT	10MF	20%	50V
C33	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C34	1-124-927-11	ELECT	4.7MF	20%	50V
C35	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C36	1-108-792-11	MYLAR	0.001MF	5%	50V
C38	1-124-925-11	ELECT	2.2MF	20%	50V
C39	1-124-907-11	ELECT	10MF	20%	50V
C40	1-126-101-11	ELECT	100MF	20%	16V
C41	1-136-153-00	FILM	0.01MF	5%	50V
C42	1-124-927-11	ELECT	4.7MF	20%	50V
C43	1-124-907-11	ELECT	10MF	20%	50V
C44	1-126-101-11	ELECT	100MF	20%	16V
C45	1-136-153-00	FILM	0.01MF	5%	50V
C46	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C48	1-124-927-11	ELECT	4.7MF	20%	50V
C49	1-126-101-11	ELECT	100MF	20%	16V
C50	1-136-153-00	FILM	0.01MF	5%	50V
C51	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C52	1-108-792-11	MYLAR	0.001MF	5%	50V
C53	1-124-925-11	ELECT	2.2MF	20%	50V
C54	1-124-120-11	ELECT	220MF	20%	16V
C55	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C56	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C57	1-124-925-11	ELECT	2.2MF	20%	50V
C58	1-124-925-11	ELECT	2.2MF	20%	50V
C59	1-124-925-11	ELECT	2.2MF	20%	50V
C60	1-124-927-11	ELECT	4.7MF	20%	50V
C61	1-124-917-11	ELECT	33MF	20%	50V
C62	1-126-233-11	ELECT	22MF	20%	50V
C63	1-124-925-11	ELECT	2.2MF	20%	50V
C64	1-124-119-00	ELECT	330MF	20%	16V
C65	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C66	1-130-471-00	FILM	0.001MF	5%	50V
C67	1-130-471-00	FILM	0.001MF	5%	50V
C68	1-124-927-11	ELECT	4.7MF	20%	50V
C69	1-108-796-11	MYLAR	0.0022MF	5%	50V
C70	1-106-359-00	MYLAR	0.0047MF	5%	50V
C71	1-124-910-11	ELECT	47MF	20%	50V
C72	1-124-907-11	ELECT	10MF	20%	50V
C73	1-136-165-00	FILM	0.1MF	5%	50V
C74	1-124-927-11	ELECT	4.7MF	20%	50V
C75	1-124-903-11	ELECT	1MF	20%	50V
C76	1-124-907-11	ELECT	10MF	20%	50V
C77	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C78	1-124-907-11	ELECT	10MF	20%	50V
C79	1-124-907-11	ELECT	10MF	20%	50V
C80	1-124-907-11	ELECT	10MF	20%	50V
C81	1-124-907-11	ELECT	10MF	20%	50V
C82	1-124-907-11	ELECT	10MF	20%	50V
C83	1-124-907-11	ELECT	10MF	20%	50V
C101	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C106	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C107	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C108	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C109	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C110	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C111	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C112	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C113	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C114	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C115	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C116	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C117	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C118	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C201	1-124-907-11	ELECT	10MF	20%	50V
C202	1-136-153-00	FILM	0.01MF	5%	50V
C203	1-136-165-00	FILM	0.1MF	5%	50V
C204	1-124-927-11	ELECT	4.7MF	20%	50V
C205	1-124-903-11	ELECT	1MF	20%	50V
C206	1-124-903-11	ELECT	1MF	20%	50V
C207	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C208	1-124-903-11	ELECT	1MF	20%	50V
C209	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C210	1-124-907-11	ELECT	10MF	20%	50V
C211	1-124-910-11	ELECT	47MF	20%	50V
C212	1-126-233-11	ELECT	22MF	20%	50V
C213	1-124-925-11	ELECT	2.2MF	20%	50V
C214	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C215	1-124-925-11	ELECT	2.2MF	20%	50V
C216	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C217	1-124-925-11	ELECT	2.2MF	20%	50V
C218	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C219	1-124-925-11	ELECT	2.2MF	20%	50V
C220	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C221	1-124-927-11	ELECT	4.7MF	20%	50V
C222	1-124-907-11	ELECT	10MF	20%	50V
C223	1-124-925-11	ELECT	2.2MF	20%	50V
C224	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C225	1-124-925-11	ELECT	2.2MF	20%	50V
C226	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C240	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C251	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C253	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C254	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C255	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C256	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C257	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C258	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C259	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C260	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C261	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C262	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C263	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C264	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C265	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C266	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C267	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C268	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C269	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C270	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C271	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C272	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C273	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C274	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C275	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C276	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C277	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C278	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C279	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C280	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C401	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C402	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C403	1-124-927-11	ELECT	4.7MF	20%	50V
C404	1-124-927-11	ELECT	4.7MF	20%	50V

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REF.NO.	PART NO.	DESCRIPTION		REMARK
C451	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C452	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C601	1-124-907-11	ELECT 10MF	20%	50V
C602	1-124-907-11	ELECT 10MF	20%	50V
C603	1-124-907-11	ELECT 10MF	20%	50V
C651	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C652	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C701	1-124-925-11	ELECT 2.2MF	20%	50V
C702	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C703	1-124-925-11	ELECT 2.2MF	20%	50V
C704	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C801	1-126-101-11	ELECT 100MF	20%	16V
C802	1-126-101-11	ELECT 100MF	20%	16V
		<DIODE>		
D1	8-719-900-95	DIODE V09G		
D2	8-719-900-95	DIODE V09G		
D3	8-719-106-71	DIODE RD12M-B2		
D4	8-719-400-18	DIODE MA152WK		
D5	8-719-105-82	DIODE RD5.1M-B2		
D6	8-719-400-18	DIODE MA152WK		
D7	8-719-400-18	DIODE MA152WK		
D8	8-719-104-34	DIODE 1S2836		
D9	8-719-948-45	DIODE ERA22-08		
D10	8-719-400-18	DIODE MA152WK		
D11	8-719-400-18	DIODE MA152WK		
D12	8-719-400-18	DIODE MA152WK		
D13	8-719-911-19	DIODE 1SS119		
D14	8-719-109-93	DIODE RD6.2ESB2		
D201	8-719-800-76	DIODE 1SS226		
D202	8-719-400-18	DIODE MA152WK		
D203	8-719-400-18	DIODE MA152WK		
D204	8-719-400-18	DIODE MA152WK		
D205	8-719-800-76	DIODE 1SS226		
D206	8-719-400-18	DIODE MA152WK		
D207	8-719-400-18	DIODE MA152WK		
D401	8-719-400-18	DIODE MA152WK		
D402	8-719-400-18	DIODE MA152WK		
D601	8-719-400-18	DIODE MA152WK		
D602	8-719-400-18	DIODE MA152WK		
D701	8-719-400-18	DIODE MA152WK		
		<CONNECTOR>		
DA1	*1-568-984-11	CONNECTOR, MALE 96P		
		<IC>		
IC1	8-759-929-62	IC LM7812CT		
IC2	8-759-982-48	IC RC79L12A		
IC3	8-759-300-78	IC HD14538BFP		
IC4	8-759-100-96	IC UPC4558G2		
IC5	8-759-300-78	IC HD14538BFP		
IC6	8-759-100-96	IC UPC4558G2		
IC7	8-759-100-93	IC UPC393G2		
IC8	8-759-300-78	IC HD14538BFP		
IC9	8-759-114-06	IC UPC814G2-1		
IC10	8-759-300-78	IC HD14538BFP		
IC11	8-759-100-93	IC UPC393G2		
IC12	8-759-300-71	IC HD14053BFP		
IC13	8-759-300-78	IC HD14538BFP		
IC14	8-759-100-93	IC UPC393G2		
IC15	8-749-922-79	IC MC-8638		

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC16	8-749-922-80	IC MC-8639	
IC17	8-759-100-93	IC UPC393G2	
IC18	8-759-114-06	IC UPC814G2-1	
IC20	8-759-114-06	IC UPC814G2-1	
IC21	8-759-114-06	IC UPC814G2-1	
IC22	8-759-100-60	IC UPC1377C	
IC201	8-752-033-65	IC CXA1158P	
IC202	8-759-925-74	IC SN74HC04ANS	
IC203	8-759-114-06	IC UPC814G2-1	
IC204	8-759-114-06	IC UPC814G2-1	
IC205	8-759-114-06	IC UPC814G2-1	
IC206	8-759-114-06	IC UPC814G2-1	
IC207	8-759-114-06	IC UPC814G2-1	
IC208	8-759-100-96	IC UPC4558G2	
IC209	8-759-100-96	IC UPC4558G2	
IC210	8-759-100-96	IC UPC4558G2	
IC211	8-759-114-06	IC UPC814G2-1	
IC212	8-759-114-06	IC UPC814G2-1	
IC213	8-759-300-71	IC HD14053BFP	
IC214	8-759-114-06	IC UPC814G2-1	
IC215	8-759-114-06	IC UPC814G2-1	
IC216	8-759-114-06	IC UPC814G2-1	
IC401	8-759-114-06	IC UPC814G2-1	
IC402	8-759-975-31	IC SN74HCT137NS-T2	
IC601	8-759-100-96	IC UPC4558G2	
IC701	8-759-114-06	IC UPC814G2-1	
		<COIL>	
L1	1-459-155-00	COIL (WITH CORE) 45UH	
L2	1-459-155-00	COIL (WITH CORE) 45UH	
L801	1-459-155-00	COIL (WITH CORE) 45UH	
L802	1-459-155-00	COIL (WITH CORE) 45UH	
		<TRANSISTOR>	
Q1	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q2	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q3	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q4	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q5	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q6	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q7	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q8	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q9	8-729-105-74	TRANSISTOR 2SK523-M1	
Q10	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q11	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q12	8-729-216-46	TRANSISTOR 2SA1162-YG	
Q13	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q14	8-729-901-01	TRANSISTOR DTC144EK	
Q15	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q16	8-729-903-10	TRANSISTOR FMW1	
Q17	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q18	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q19	8-729-904-04	TRANSISTOR FMS2	
Q20	8-729-903-10	TRANSISTOR FMW1	
Q21	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q22	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q201	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q202	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q203	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q204	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q205	8-729-230-49	TRANSISTOR 2SC2712-YG	

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q206	8-729-903-82	TRANSISTOR FMW2	
Q207	8-729-920-59	TRANSISTOR IMX2	
Q208	8-729-904-04	TRANSISTOR FMS2	
Q209	8-729-903-10	TRANSISTOR FMW1	
Q210	8-729-903-10	TRANSISTOR FMW1	
Q211	8-729-920-59	TRANSISTOR IMX2	
Q212	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q213	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q214	8-729-903-10	TRANSISTOR FMW1	
Q215	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q216	8-729-903-82	TRANSISTOR FMW2	
Q217	8-729-920-59	TRANSISTOR IMX2	
Q218	8-729-904-04	TRANSISTOR FMS2	
Q219	8-729-903-10	TRANSISTOR FMW1	
Q220	8-729-903-10	TRANSISTOR FMW1	
Q221	8-729-920-59	TRANSISTOR IMX2	
Q222	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q223	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q224	8-729-903-82	TRANSISTOR FMW2	
Q225	8-729-920-59	TRANSISTOR IMX2	
Q226	8-729-904-04	TRANSISTOR FMS2	
Q227	8-729-903-10	TRANSISTOR FMW1	
Q228	8-729-903-10	TRANSISTOR FMW1	
Q229	8-729-920-59	TRANSISTOR IMX2	
Q230	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q231	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q232	8-729-902-96	TRANSISTOR FMS1	
Q233	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q234	8-729-902-96	TRANSISTOR FMS1	
Q235	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q236	8-729-903-10	TRANSISTOR FMW1	
Q237	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q238	8-729-903-10	TRANSISTOR FMW1	
Q239	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q401	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q402	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q601	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q602	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q603	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q604	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q605	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q701	8-729-903-82	TRANSISTOR FMW2	
Q702	8-729-920-59	TRANSISTOR IMX2	
Q703	8-729-904-04	TRANSISTOR FMS2	
Q704	8-729-903-10	TRANSISTOR FMW1	
Q705	8-729-903-10	TRANSISTOR FMW1	
Q706	8-729-920-59	TRANSISTOR IMX2	
Q707	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q708	8-729-230-46	TRANSISTOR 2SA1162-YG	
Q709	8-729-904-04	TRANSISTOR FMS2	
Q801	8-729-205-96	TRANSISTOR 2SC3668-O	
Q802	8-729-205-95	TRANSISTOR 2SA1428Y	
Q803	8-729-901-01	TRANSISTOR DTC144EK	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
R1	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R2	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R3	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R4	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R5	1-216-659-11	METAL CHIP 2.2K 0.50% 1/10W	
R6	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R7	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R8	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R9	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R10	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R11	1-216-093-00	METAL GLAZE 68K 5% 1/10W	
R12	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R13	1-216-699-11	METAL CHIP 100K 0.50% 1/10W	
R14	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R15	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R16	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R17	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R18	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R19	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R20	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R21	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R22	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R23	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R24	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R25	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R26	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R27	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R28	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R29	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R30	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R31	1-216-099-00	METAL GLAZE 120K 5% 1/10W	
R32	1-216-105-00	METAL GLAZE 220K 5% 1/10W	
R33	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R34	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R35	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R36	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R37	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R38	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R39	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R40	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R41	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R42	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R43	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R44	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R45	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R46	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R47	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R48	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R49	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R50	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R51	1-216-685-11	METAL CHIP 27K 0.50% 1/10W	
R52	1-216-693-11	METAL CHIP 56K 0.50% 1/10W	
R53	1-216-677-11	METAL CHIP 12K 0.50% 1/10W	
R54	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R55	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R56	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R57	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R58	1-216-679-11	METAL CHIP 15K 0.50% 1/10W	
R59	1-216-693-11	METAL CHIP 56K 0.50% 1/10W	
R60	1-216-677-11	METAL CHIP 12K 0.50% 1/10W	
R61	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R62	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R63	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R64	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R65	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R66	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R67	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R68	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R69	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R70	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R71	1-216-089-00	METAL GLAZE 47K 5% 1/10W	

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REF.NO.	PART NO.	DESCRIPTION				REMARK
R72	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R73	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R74	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R75	1-216-095-00	METAL GLAZE	82K	5%	1/10W	
R76	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R77	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R78	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R79	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R80	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R81	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R82	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R83	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R84	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R85	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R86	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R87	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R88	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R89	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R90	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R91	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R92	1-216-661-11	METAL CHIP	2.7K	0.50%	1/10W	
R93	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R94	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R95	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R96	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R97	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R98	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R99	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R100	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R101	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R102	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R103	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R104	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R105	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R106	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R107	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R108	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R109	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R110	1-216-673-11	METAL CHIP	8.2K	0.50%	1/10W	
R111	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R112	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R113	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R114	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R115	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R116	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R117	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R118	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R119	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R120	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R121	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R122	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R123	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R124	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R125	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R126	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R127	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R128	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R129	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R130	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R132	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R133	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R134	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R135	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R136	1-216-033-00	METAL GLAZE	220	5%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R137	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R138	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R139	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R140	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R141	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R142	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R143	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R144	1-216-677-11	METAL CHIP	12K	0.50%	1/10W	
R145	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R146	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R147	1-216-685-11	METAL CHIP	27K	0.50%	1/10W	
R148	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R149	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R150	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R151	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R152	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R153	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R154	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R155	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R156	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R157	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R158	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R159	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R160	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R161	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R162	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R163	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R164	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R165	1-216-697-11	METAL CHIP	82K	0.50%	1/10W	
R166	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R167	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R168	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R169	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R170	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R171	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R172	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R173	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R174	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R176	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R177	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R178	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R179	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	
R180	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R181	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R201	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R202	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R203	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R204	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R205	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R206	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R207	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R208	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R209	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R210	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R211	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R212	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R213	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R214	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R215	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R216	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R217	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R218	1-216-049-00	METAL GLAZE	1K	5%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R219	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R220	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R221	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R222	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R223	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R224	1-216-093-00	METAL GLAZE	68K	5%	1/10W	
R225	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R226	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R227	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R228	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R229	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R230	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R231	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R232	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R233	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R234	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R235	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R236	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R237	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R238	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R239	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R240	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R241	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R242	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R243	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R244	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R245	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R246	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R247	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R248	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R249	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R250	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R251	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R252	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R253	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R254	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R255	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R256	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R257	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R258	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R259	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R260	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R261	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R262	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R263	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R264	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R265	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R266	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R267	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R268	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R269	1-216-639-11	METAL CHIP	330	0.50%	1/10W	
R270	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R271	1-216-615-11	METAL CHIP	33	0.50%	1/10W	
R272	1-216-615-11	METAL CHIP	33	0.50%	1/10W	
R273	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R274	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R275	1-216-639-11	METAL CHIP	330	0.50%	1/10W	
R276	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R277	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R278	1-216-669-11	METAL CHIP	5.6K	0.50%	1/10W	
R279	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R280	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R281	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R282	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R283	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R284	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R285	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R286	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R287	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R288	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R289	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R290	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R291	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R292	1-216-639-11	METAL CHIP	330	0.50%	1/10W	
R293	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R294	1-216-615-11	METAL CHIP	33	0.50%	1/10W	
R295	1-216-615-11	METAL CHIP	33	0.50%	1/10W	
R296	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R297	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R298	1-216-639-11	METAL CHIP	330	0.50%	1/10W	
R299	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R300	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R301	1-216-669-11	METAL CHIP	5.6K	0.50%	1/10W	
R302	1-216-647-11	METAL CHIP	680	0.50%	1/10W	
R303	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R304	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R305	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R306	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R307	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R308	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R309	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R310	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R311	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R312	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R313	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R314	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R315	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R316	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R317	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R318	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R319	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R320	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R321	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R322	1-216-639-11	METAL CHIP	330	0.50%	1/10W	
R323	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R324	1-216-615-11	METAL CHIP	33	0.50%	1/10W	
R325	1-216-615-11	METAL CHIP	33	0.50%	1/10W	
R326	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R327	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R328	1-216-639-11	METAL CHIP	330	0.50%	1/10W	
R329	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R330	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R331	1-216-669-11	METAL CHIP	5.6K	0.50%	1/10W	
R332	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R333	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R334	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R335	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R336	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R337	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R338	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R339	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R340	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R341	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R342	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R343	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R344	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R345	1-216-025-00	METAL GLAZE	100	5%	1/10W	

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REF.NO.	PART NO.	DESCRIPTION				REMARK
R346	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R347	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R348	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R349	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R350	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R351	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R352	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R353	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R354	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R355	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R356	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R357	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R358	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R359	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R360	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R361	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R364	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R365	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R366	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R401	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R402	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R403	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R404	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R405	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R406	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R407	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R408	1-216-687-11	METAL CHIP	33K	0.50%	1/10W	
R409	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R410	1-216-699-11	METAL CHIP	100K	0.50%	1/10W	
R411	1-216-687-11	METAL CHIP	33K	0.50%	1/10W	
R412	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R413	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R414	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R415	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R416	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R417	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R418	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R601	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R602	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R603	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R604	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R605	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R606	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R607	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R608	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R609	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R610	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R611	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R612	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R613	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	
R614	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R615	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R701	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R702	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R703	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R704	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R705	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R706	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R707	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R708	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R709	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R710	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R711	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R712	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R713	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R714	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R715	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R716	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R717	1-216-748-11	METAL GLAZE	39K	5%	1/10W	
R718	1-216-069-00	METAL GLAZE	6.8K	5%	1/10W	
R719	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R720	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R721	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R722	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R723	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R724	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R725	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R726	1-216-039-00	METAL GLAZE	390	5%	1/10W	
R727	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R728	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R729	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R730	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R732	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R733	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R801	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R802	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R803	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R804	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R807	1-216-049-00	METAL GLAZE	1K	5%	1/10W	

<VARIABLE RESISTOR>

RV1	1-237-503-21	RES, ADJ, CERMET 10K
RV2	1-237-503-21	RES, ADJ, CERMET 10K
RV3	1-237-501-21	RES, ADJ, CERMET 2K
RV4	1-237-505-21	RES, ADJ, CERMET 50K
RV5	1-237-505-21	RES, ADJ, CERMET 50K
RV6	1-237-504-21	RES, ADJ, CERMET 20K

<SWITCH>

S1	1-570-865-11	SWITCH, SLIDE
S2	1-570-865-11	SWITCH, SLIDE

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*A-1346-003-A DB BOARD, COMPLETE
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<CAPACITOR>

C1501	1-126-157-11	ELECT	10MF	20%	16V
C1502	1-126-157-11	ELECT	10MF	20%	16V
C1503	1-126-157-11	ELECT	10MF	20%	16V
C1504	1-126-157-11	ELECT	10MF	20%	16V
C1505	1-126-157-11	ELECT	10MF	20%	16V
C1506	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1507	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1508	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1509	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1510	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1511	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1512	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1513	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1514	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1515	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1516	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C1517	1-163-031-11	CERAMIC CHIP	0.01MF		50V

REF.NO.	PART NO.	DESCRIPTION		REMARK
C1518	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1519	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1520	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1521	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1522	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1523	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1524	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1525	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1526	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1527	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1528	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1529	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1530	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1531	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1532	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1533	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1534	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1535	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1536	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1537	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1538	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1539	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1540	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1541	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1542	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1543	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1544	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1545	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1546	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1547	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1548	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1549	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1550	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1551	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1552	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1553	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1554	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1555	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1556	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1557	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1558	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1559	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1560	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1561	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1562	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1563	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1564	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1565	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1566	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1567	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1568	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1569	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1570	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1571	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1572	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1573	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1574	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1575	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1577	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1578	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1580	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1581	1-163-031-11	CERAMIC CHIP 0.01MF		50V
C1582	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
C1583	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V

REF.NO.	PART NO.	DESCRIPTION		REMARK
C1584	1-164-161-11	CERAMIC CHIP 0.0022MF	10%	50V
		<DIODE>		
D1503	8-719-800-76	DIODE 1SS226		
D1504	8-719-800-76	DIODE 1SS226		
D1505	8-719-800-76	DIODE 1SS226		
D1506	8-719-800-76	DIODE 1SS226		
D1507	8-719-800-76	DIODE 1SS226		
D1508	8-719-800-76	DIODE 1SS226		
		<CONNECTOR>		
DB1501	*1-568-984-11	CONNECTOR, MALE 96P		
		<IC>		
IC1501	8-759-304-94	IC HD74HC245FP		
IC1502	8-759-304-94	IC HD74HC245FP		
IC1503	8-759-304-94	IC HD74HC245FP		
IC1504	8-759-304-94	IC HD74HC245FP		
IC1505	8-759-926-11	IC SN74HC138ANS		
IC1506	8-759-926-11	IC SN74HC138ANS		
IC1507	8-759-926-11	IC SN74HC138ANS		
IC1508	8-759-926-11	IC SN74HC138ANS		
IC1509	8-759-926-11	IC SN74HC138ANS		
IC1510	8-759-926-11	IC SN74HC138ANS		
IC1511	8-759-995-64	IC MB86023		
IC1512	8-759-995-64	IC MB86023		
IC1513	8-759-995-64	IC MB86023		
IC1514	8-759-995-64	IC MB86023		
IC1515	8-759-995-64	IC MB86023		
IC1516	8-759-995-64	IC MB86023		
IC1517	8-759-995-64	IC MB86023		
IC1518	8-759-995-64	IC MB86023		
IC1519	8-759-995-64	IC MB86023		
IC1520	8-759-995-64	IC MB86023		
IC1521	8-759-995-64	IC MB86023		
IC1522	8-759-995-64	IC MB86023		
IC1523	8-759-995-64	IC MB86023		
IC1524	8-759-995-64	IC MB86023		
IC1525	8-759-995-64	IC MB86023		
IC1526	8-759-995-64	IC MB86023		
IC1527	8-759-995-64	IC MB86023		
IC1528	8-759-995-64	IC MB86023		
IC1529	8-759-995-64	IC MB86023		
IC1530	8-759-995-64	IC MB86023		
IC1531	8-759-995-64	IC MB86023		
IC1532	8-759-995-64	IC MB86023		
IC1533	8-759-995-64	IC MB86023		
IC1534	8-759-995-64	IC MB86023		
IC1535	8-759-995-64	IC MB86023		
IC1536	8-759-995-64	IC MB86023		
IC1537	8-759-995-64	IC MB86023		
IC1538	8-759-995-64	IC MB86023		
IC1539	8-759-995-64	IC MB86023		
IC1540	8-759-995-64	IC MB86023		
IC1541	8-759-995-64	IC MB86023		
IC1542	8-759-995-64	IC MB86023		
IC1543	8-759-995-64	IC MB86023		
IC1544	8-759-995-64	IC MB86023		
IC1545	8-759-995-64	IC MB86023		
IC1546	8-759-995-64	IC MB86023		

DB

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC1547	8-759-100-96	IC UPC4558G2	
IC1548	8-759-100-96	IC UPC4558G2	
IC1549	8-759-114-06	IC UPC814G2-1	
IC1550	8-759-114-06	IC UPC814G2-1	
IC1551	8-759-114-06	IC UPC814G2-1	
IC1552	8-759-908-15	IC TL431CLP	
		<COIL>	
L1501	1-459-155-00	COIL (WITH CORE) 45UH	
L1502	1-459-155-00	COIL (WITH CORE) 45UH	
		<TRANSISTOR>	
Q1501	8-729-205-96	TRANSISTOR 2SC3668-O	
Q1502	8-729-205-95	TRANSISTOR 2SA1428Y	
		<RESISTOR>	
R1501	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1502	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1503	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1504	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1505	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1506	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1507	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1508	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1509	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1510	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1511	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1512	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1513	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1514	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1515	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1516	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1517	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1518	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1519	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1520	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1521	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1522	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1523	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1524	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1525	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1526	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1527	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1528	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1529	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1530	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1531	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1532	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1533	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1534	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1535	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1536	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R1537	1-216-653-11	METAL CHIP 1.2K 0.50% 1/10W	
R1538	1-216-653-11	METAL CHIP 1.2K 0.50% 1/10W	
R1539	1-216-653-11	METAL CHIP 1.2K 0.50% 1/10W	
R1540	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1541	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R1542	1-216-671-11	METAL CHIP 6.8K 0.50% 1/10W	
R1543	1-216-671-11	METAL CHIP 6.8K 0.50% 1/10W	
R1544	1-216-671-11	METAL CHIP 6.8K 0.50% 1/10W	
R1545	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1546	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R1547	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W	
R1548	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W	
R1549	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W	
R1550	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1551	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R1552	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1553	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1554	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1555	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1556	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1557	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1558	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1559	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R1560	1-216-645-11	METAL CHIP 560 0.50% 1/10W	
R1561	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W	
R1562	1-216-663-11	METAL CHIP 3.3K 0.50% 1/10W	
R1563	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1565	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1566	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1567	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1568	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1569	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1570	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1571	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R1572	1-216-697-11	METAL CHIP 82K 0.50% 1/10W	
R1573	1-216-697-11	METAL CHIP 82K 0.50% 1/10W	
R1574	1-216-697-11	METAL CHIP 82K 0.50% 1/10W	
R1575	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1576	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R1577	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R1578	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R1579	1-216-113-00	METAL GLAZE 470K 5% 1/10W	
R1580	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1581	1-216-676-11	METAL CHIP 11K 0.50% 1/10W	
R1582	1-216-676-11	METAL CHIP 11K 0.50% 1/10W	
R1583	1-216-676-11	METAL CHIP 11K 0.50% 1/10W	
R1584	1-216-697-11	METAL CHIP 82K 0.50% 1/10W	
R1585	1-216-697-11	METAL CHIP 82K 0.50% 1/10W	
R1586	1-216-697-11	METAL CHIP 82K 0.50% 1/10W	
R1587	1-216-697-11	METAL CHIP 82K 0.50% 1/10W	
R1588	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1589	**1-216-109-00**	**METAL GLAZE 330K 5% 1/10W**	
R1590	**1-216-109-00**	**METAL GLAZE 330K 5% 1/10W**	
R1591	**1-216-109-00**	**METAL GLAZE 330K 5% 1/10W**	
R1592	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R1593	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R1594	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R1595	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1596	1-216-685-11	METAL CHIP 27K 0.50% 1/10W	
R1597	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1598	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	
R1599	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1601	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R1602	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R1603	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R1604	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1606	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R1607	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R1608	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R1609	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R1610	1-216-659-11	METAL CHIP 2.2K 0.50% 1/10W	
R1611	1-216-675-11	METAL CHIP 10K 0.50% 1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1612	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1613	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1614	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1615	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1616	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1617	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1618	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1619	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1620	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1621	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1622	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1623	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1624	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1625	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1626	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1627	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1628	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1629	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1630	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1631	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1632	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1633	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1634	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1635	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1636	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1637	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1638	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1639	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1640	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1641	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1642	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1643	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1644	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1645	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1646	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1647	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1648	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1649	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1650	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1651	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1652	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1653	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1654	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1655	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1656	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1657	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1658	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1659	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1660	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1661	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1662	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1663	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1664	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1665	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1666	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1667	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1668	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1669	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1670	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1671	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1672	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1673	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1674	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1675	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1676	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R1677	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1678	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1679	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1680	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1681	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1682	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1683	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1684	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1685	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1686	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1687	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1688	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1689	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1690	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1691	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1692	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1693	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1694	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1695	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1696	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1697	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R1698	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R1699	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1700	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1701	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R1702	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1703	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1704	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R1705	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1706	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1707	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R1708	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1709	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1710	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R1711	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1712	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1713	1-216-663-11	METAL CHIP	3.3K	0.50%	1/10W	
R1714	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1715	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1716	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R1717	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1718	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1719	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R1720	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1721	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1722	1-216-679-11	METAL CHIP	15K	0.50%	1/10W	
R1723	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1724	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R1725	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1726	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1727	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R1728	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R1729	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R1801	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R1802	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R1803	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R1804	1-216-671-11	METAL CHIP	6.8K	0.50%	1/10W	
R1805	1-216-101-00	METAL GLAZE	150K	5%	1/10W	
R1806	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1807	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1808	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1809	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1810	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1811	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1812	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R1813	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W	
R1814	1-216-645-11	METAL CHIP	560	0.50%	1/10W	
R1815	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R1816	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R1817	1-216-655-11	METAL CHIP	1.5K	0.50%	1/10W	
R1818	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1819	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1820	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R1821	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R2000	1-216-619-11	METAL CHIP	47	0.50%	1/10W	
R2001	1-216-619-11	METAL CHIP	47	0.50%	1/10W	

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*A-1346-004-A DC BOARD, COMPLETE
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	*1-508-742-00	PIN, CONNECTOR 3P
	*1-564-507-11	PLUG, CONNECTOR 4P
	*1-564-508-11	PLUG, CONNECTOR 5P
	*1-564-509-11	PLUG, CONNECTOR 6P
	*1-564-514-11	PLUG, CONNECTOR 11P
	*1-564-515-11	PLUG, CONNECTOR 12P
	4-382-854-11	SCREW (M3X10), P, SW (+)
	*4-395-525-01	HOLDER (D), TR
	*4-395-527-01	HOLDER (B), TR
	4-874-042-00	SHEET, INSULATING

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-124-122-11	ELECT	100MF	20%	50V	
C2	1-126-101-11	ELECT	100MF	20%	16V	
C3	1-124-122-11	ELECT	100MF	20%	50V	
C4	1-126-101-11	ELECT	100MF	20%	16V	
C5	1-124-122-11	ELECT	100MF	20%	50V	
C6	1-102-963-00	CERAMIC	33PF	5%	50V	
C7	1-102-963-00	CERAMIC	33PF	5%	50V	
C8	1-163-157-00	FILM	0.022MF	5%	50V	
C9	1-124-903-11	ELECT	1MF	20%	50V	
C10	1-124-122-11	ELECT	100MF	20%	50V	
C11	1-102-963-00	CERAMIC	33PF	5%	50V	
C12	1-102-963-00	CERAMIC	33PF	5%	50V	
C13	1-163-157-00	FILM	0.022MF	5%	50V	
C14	1-124-903-11	ELECT	1MF	20%	50V	
C15	1-124-122-11	ELECT	100MF	20%	50V	
C16	1-102-963-00	CERAMIC	33PF	5%	50V	
C17	1-102-963-00	CERAMIC	33PF	5%	50V	
C18	1-163-157-00	FILM	0.022MF	5%	50V	
C19	1-124-903-11	ELECT	1MF	20%	50V	
C20	1-136-173-00	FILM	0.47MF	5%	50V	
C21	1-124-556-11	ELECT	2200MF	20%	16V	
C22	1-124-556-11	ELECT	2200MF	20%	16V	
C24	1-136-165-00	FILM	0.1MF	5%	50V	
C25	1-136-165-00	FILM	0.1MF	5%	50V	
C26	1-136-165-00	FILM	0.1MF	5%	50V	
C27	1-136-165-00	FILM	0.1MF	5%	50V	
C28	1-136-165-00	FILM	0.1MF	5%	50V	
C29	1-136-165-00	FILM	0.1MF	5%	50V	
C30	1-136-165-00	FILM	0.1MF	5%	50V	
C31	1-136-165-00	FILM	0.1MF	5%	50V	
C32	1-136-165-00	FILM	0.1MF	5%	50V	
C33	1-124-477-11	ELECT	47MF	20%	16V	
C34	1-124-903-11	ELECT	1MF	20%	50V	
C35	1-124-360-00	ELECT	1000MF	20%	16V	
C36	1-124-907-11	ELECT	10MF	20%	50V	
C37	1-124-907-11	ELECT	10MF	20%	50V	
C101	1-102-824-00	CERAMIC	470PF	5%	50V	
C102	1-124-903-11	ELECT	1MF	20%	50V	
C103	1-101-004-00	CERAMIC	0.01MF		50V	
C104	1-124-122-11	ELECT	100MF	20%	50V	
C105	1-124-922-11	ELECT	1000MF	20%	50V	
C106	1-124-903-11	ELECT	1MF	20%	50V	
C107	1-101-004-00	CERAMIC	0.01MF		50V	
C108	1-124-122-11	ELECT	100MF	20%	50V	
C109	1-124-922-11	ELECT	1000MF	20%	50V	
C110	1-136-171-00	FILM	0.033MF	5%	50V	
C111	1-136-171-00	FILM	0.033MF	5%	50V	
C201	1-130-473-00	MYLAR	0.0015MF	5%	50V	
C202	1-102-973-00	CERAMIC	100PF	5%	50V	
C203	1-102-973-00	CERAMIC	100PF	5%	50V	
C204	1-136-153-00	FILM	0.01MF	5%	50V	
C205	1-124-477-11	ELECT	47MF	20%	16V	
C206	1-124-122-11	ELECT	100MF	20%	50V	
C207	1-101-004-00	CERAMIC	0.01MF		50V	
C208	1-124-122-11	ELECT	100MF	20%	50V	
C209	1-101-004-00	CERAMIC	0.01MF		50V	
C210	1-130-473-00	MYLAR	0.0015MF	5%	50V	
C211	1-102-973-00	CERAMIC	100PF	5%	50V	
C212	1-102-973-00	CERAMIC	100PF	5%	50V	
C213	1-136-153-00	FILM	0.01MF	5%	50V	
C214	1-124-477-11	ELECT	47MF	20%	16V	
C215	1-124-122-11	ELECT	100MF	20%	50V	
C216	1-101-004-00	CERAMIC	0.01MF		50V	
C217	1-124-122-11	ELECT	100MF	20%	50V	
C218	1-101-004-00	CERAMIC	0.01MF		50V	
C219	1-130-473-00	MYLAR	0.0015MF	5%	50V	
C220	1-102-973-00	CERAMIC	100PF	5%	50V	
C221	1-102-973-00	CERAMIC	100PF	5%	50V	
C222	1-136-153-00	FILM	0.01MF	5%	50V	
C223	1-124-477-11	ELECT	47MF	20%	16V	
C224	1-124-122-11	ELECT	100MF	20%	50V	
C225	1-101-004-00	CERAMIC	0.01MF		50V	
C226	1-124-122-11	ELECT	100MF	20%	50V	
C227	1-101-004-00	CERAMIC	0.01MF		50V	
C228	1-124-907-11	ELECT	10MF	20%	50V	
C229	1-101-004-00	CERAMIC	0.01MF		50V	
C230	1-124-907-11	ELECT	10MF	20%	50V	
C231	1-101-004-00	CERAMIC	0.01MF		50V	
C232	1-124-907-11	ELECT	10MF	20%	50V	
C233	1-101-004-00	CERAMIC	0.01MF		50V	
C234	1-124-907-11	ELECT	10MF	20%	50V	
C235	1-101-004-00	CERAMIC	0.01MF		50V	
C236	1-124-907-11	ELECT	10MF	20%	50V	
C237	1-101-004-00	CERAMIC	0.01MF		50V	
C238	1-124-907-11	ELECT	10MF	20%	50V	
C239	1-101-004-00	CERAMIC	0.01MF		50V	
C243	1-102-978-00	CERAMIC	220PF	5%	50V	
C244	1-102-978-00	CERAMIC	220PF	5%	50V	
C245	1-102-978-00	CERAMIC	220PF	5%	50V	
C246	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C247	1-130-471-00	MYLAR	0.001MF	5%	50V	
C248	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C249	1-130-471-00	MYLAR	0.001MF	5%	50V	
C250	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C251	1-130-471-00	MYLAR	0.001MF	5%	50V	
C301	1-130-473-00	MYLAR	0.0015MF	5%	50V	

REF.NO.	PART NO.	DESCRIPTION				REMARK
C302	1-102-973-00	CERAMIC	100PF	5%	50V	
C303	1-102-973-00	CERAMIC	100PF	5%	50V	
C304	1-136-153-00	FILM	0.01MF	5%	50V	
C305	1-124-477-11	ELECT	47MF	20%	16V	
C306	1-124-122-11	ELECT	100MF	20%	50V	
C307	1-101-004-00	CERAMIC	0.01MF		50V	
C308	1-124-122-11	ELECT	100MF	20%	50V	
C309	1-101-004-00	CERAMIC	0.01MF		50V	
C310	1-130-473-00	MYLAR	0.0015MF	5%	50V	
C311	1-102-973-00	CERAMIC	100PF	5%	50V	
C312	1-102-973-00	CERAMIC	100PF	5%	50V	
C313	1-136-153-00	FILM	0.01MF	5%	50V	
C314	1-124-477-11	ELECT	47MF	20%	16V	
C315	1-124-122-11	ELECT	100MF	20%	50V	
C316	1-101-004-00	CERAMIC	0.01MF		50V	
C317	1-124-122-11	ELECT	100MF	20%	50V	
C318	1-101-004-00	CERAMIC	0.01MF		50V	
C319	1-130-473-00	MYLAR	0.0015MF	5%	50V	
C320	1-102-973-00	CERAMIC	100PF	5%	50V	
C321	1-102-973-00	CERAMIC	100PF	5%	50V	
C322	1-136-153-00	FILM	0.01MF	5%	50V	
C323	1-124-477-11	ELECT	47MF	20%	16V	
C324	1-124-477-11	ELECT	47MF	20%	16V	
C325	1-101-004-00	CERAMIC	0.01MF		50V	
C326	1-124-477-11	ELECT	47MF	20%	16V	
C327	1-101-004-00	CERAMIC	0.01MF		50V	
C328	1-124-907-11	ELECT	10MF	20%	50V	
C329	1-101-004-00	CERAMIC	0.01MF		50V	
C330	1-124-907-11	ELECT	10MF	20%	50V	
C331	1-101-004-00	CERAMIC	0.01MF		50V	
C332	1-124-907-11	ELECT	10MF	20%	50V	
C333	1-101-004-00	CERAMIC	0.01MF		50V	
C334	1-124-907-11	ELECT	10MF	20%	50V	
C335	1-101-004-00	CERAMIC	0.01MF		50V	
C336	1-124-907-11	ELECT	10MF	20%	50V	
C337	1-101-004-00	CERAMIC	0.01MF		50V	
C338	1-124-907-11	ELECT	10MF	20%	50V	
C339	1-101-004-00	CERAMIC	0.01MF		50V	
C343	1-102-824-00	CERAMIC	470PF	5%	50V	
C344	1-102-824-00	CERAMIC	470PF	5%	50V	
C345	1-102-824-00	CERAMIC	470PF	5%	50V	
C346	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C347	1-130-471-00	MYLAR	0.001MF	5%	50V	
C348	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C349	1-130-471-00	MYLAR	0.001MF	5%	50V	
C350	1-102-947-00	CERAMIC	10PF	0.5PF	50V	
C351	1-130-471-00	MYLAR	0.001MF	5%	50V	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D1	8-719-900-95	DIODE V09G	
D2	8-719-900-95	DIODE V09G	
D3	8-719-900-95	DIODE V09G	
D4	8-719-911-19	DIODE 1SS119	
D5	8-719-900-95	DIODE V09G	
D6	8-719-911-19	DIODE 1SS119	
D7	8-719-900-95	DIODE V09G	
D8	8-719-911-19	DIODE 1SS119	
D9	8-719-911-19	DIODE 1SS119	
D10	8-719-911-19	DIODE 1SS119	
D11	8-719-911-19	DIODE 1SS119	
D12	8-719-911-19	DIODE 1SS119	
D13	8-719-911-19	DIODE 1SS119	
D15	8-719-911-19	DIODE 1SS119	
D16	8-719-911-19	DIODE 1SS119	
D101	8-719-911-19	DIODE 1SS119	
D102	8-719-908-20	DIODE ERC88-009	
D103	8-719-908-20	DIODE ERC88-009	
D104	8-719-911-19	DIODE 1SS119	
D105	8-719-908-20	DIODE ERC88-009	
D106	8-719-908-20	DIODE ERC88-009	
D201	8-719-110-41	DIODE RD15ES-B2	
D202	8-719-109-66	DIODE RD3.3ES-B2	
D203	8-719-911-19	DIODE 1SS119	
D204	8-719-911-19	DIODE 1SS119	
D205	8-719-110-41	DIODE RD15ES-B2	
D206	8-719-109-66	DIODE RD3.3ES-B2	
D207	8-719-911-19	DIODE 1SS119	
D208	8-719-911-19	DIODE 1SS119	
D209	8-719-110-41	DIODE RD15ES-B2	
D210	8-719-109-66	DIODE RD3.3ES-B2	
D211	8-719-911-19	DIODE 1SS119	
D212	8-719-911-19	DIODE 1SS119	
D301	8-719-110-41	DIODE RD15ES-B2	
D302	8-719-109-66	DIODE RD3.3ES-B2	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-911-19	DIODE 1SS119	
D305	8-719-110-41	DIODE RD15ES-B2	
D306	8-719-109-66	DIODE RD3.3ES-B2	
D307	8-719-911-19	DIODE 1SS119	
D308	8-719-911-19	DIODE 1SS119	
D309	8-719-110-41	DIODE RD15ES-B2	
D310	8-719-109-66	DIODE RD3.3ES-B2	
D311	8-719-911-19	DIODE 1SS119	
D312	8-719-911-19	DIODE 1SS119	

<FERRITE BEAD INDUCTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
FB1	1-410-396-41	FERRITE BEAD INDUCTOR	
FB2	1-410-396-41	FERRITE BEAD INDUCTOR	
FB3	1-410-396-41	FERRITE BEAD INDUCTOR	
FB4	1-410-396-41	FERRITE BEAD INDUCTOR	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC1	8-759-929-62	IC LM7812CT	
IC2	8-759-929-65	IC LM7912CT	
IC3	8-759-145-58	IC UPC4558C	
IC4	8-759-113-13	IC UPC1498H	
IC5	8-759-145-58	IC UPC4558C	
IC6	8-759-113-13	IC UPC1498H	
IC7	8-759-145-58	IC UPC4558C	
IC8	8-759-113-13	IC UPC1498H	
IC9	8-759-145-58	IC UPC4558C	
IC101	8-759-109-82	IC UPC814C	
IC102	8-759-109-82	IC UPC814C	
IC103	8-759-109-82	IC UPC814C	
IC201	8-759-973-02	IC LM6364N	
IC202	8-759-973-02	IC LM6364N	
IC203	8-759-973-02	IC LM6364N	
IC301	8-759-973-02	IC LM6364N	
IC302	8-759-973-02	IC LM6364N	
IC303	8-759-973-02	IC LM6364N	

<COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
L103	1-459-155-00	COIL (WITH CORE) 45UH	
L104	1-459-155-00	COIL (WITH CORE) 45UH	

DC

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q2	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q4	8-729-900-89	TRANSISTOR DTC144ES	
Q5	8-729-900-89	TRANSISTOR DTC144ES	
Q6	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q7	8-729-900-89	TRANSISTOR DTC144ES	
Q8	8-729-900-89	TRANSISTOR DTC144ES	
Q9	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q10	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q11	8-729-900-89	TRANSISTOR DTC144ES	
Q13	8-729-900-89	TRANSISTOR DTC144ES	
Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q102	8-729-105-74	TRANSISTOR 2SK523-M1	
Q103	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q104	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q105	8-729-142-68	TRANSISTOR 2SJ143	
Q106	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q107	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q108	8-729-142-69	TRANSISTOR 2SK817	
Q201	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q202	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q203	8-729-142-74	TRANSISTOR 2SD1977	
Q204	8-729-142-70	TRANSISTOR 2SB1315	
Q205	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q206	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q207	8-729-142-74	TRANSISTOR 2SD1977	
Q208	8-729-142-70	TRANSISTOR 2SB1315	
Q209	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q210	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q211	8-729-142-74	TRANSISTOR 2SD1977	
Q212	8-729-142-70	TRANSISTOR 2SB1315	
Q301	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q302	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q303	8-729-142-74	TRANSISTOR 2SD1977	
Q304	8-729-142-70	TRANSISTOR 2SB1315	
Q305	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q306	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q307	8-729-142-74	TRANSISTOR 2SD1977	
Q308	8-729-142-70	TRANSISTOR 2SB1315	
Q309	8-729-207-89	TRANSISTOR 2SA1358-Y	
Q310	8-729-207-82	TRANSISTOR 2SC3421-Y	
Q311	8-729-142-74	TRANSISTOR 2SD1977	
Q312	8-729-142-70	TRANSISTOR 2SB1315	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-215-463-00	METAL	56K	1%	1/4W	
R2	1-215-445-00	METAL	10K	1%	1/4W	
R3	1-215-445-00	METAL	10K	1%	1/4W	
R4	1-214-800-11	METAL	2.2	1%	1/2W	
R5	1-214-800-11	METAL	2.2	1%	1/2W	
R6	1-215-429-00	METAL	2.2K	1%	1/4W	
R7	1-215-421-00	METAL	1K	1%	1/4W	
R8	1-215-898-11	METAL OXIDE	10K	5%	2W	F
R9	1-249-433-11	CARBON	22K	5%	1/4W	
R10	1-249-417-11	CARBON	1K	5%	1/4W	
R11	1-249-441-11	CARBON	100K	5%	1/4W	
R12	1-249-429-11	CARBON	10K	5%	1/4W	
R13	1-249-429-11	CARBON	10K	5%	1/4W	
R14	1-249-429-11	CARBON	10K	5%	1/4W	
R15	1-215-463-00	METAL	56K	1%	1/4W	
R16	1-215-445-00	METAL	10K	1%	1/4W	
R17	1-215-445-00	METAL	10K	1%	1/4W	
R18	1-214-800-11	METAL	2.2	1%	1/2W	
R19	1-214-800-11	METAL	2.2	1%	1/2W	
R20	1-215-429-00	METAL	2.2K	1%	1/4W	
R21	1-215-421-00	METAL	1K	1%	1/4W	
R22	1-215-898-11	METAL OXIDE	10K	5%	2W	F
R23	1-249-433-11	CARBON	22K	5%	1/4W	
R24	1-249-417-11	CARBON	1K	5%	1/4W	
R25	1-249-441-11	CARBON	100K	5%	1/4W	
R26	1-249-429-11	CARBON	10K	5%	1/4W	
R27	1-249-429-11	CARBON	10K	5%	1/4W	
R28	1-249-429-11	CARBON	10K	5%	1/4W	
R29	1-215-463-00	METAL	56K	1%	1/4W	
R30	1-215-445-00	METAL	10K	1%	1/4W	
R31	1-215-445-00	METAL	10K	1%	1/4W	
R32	1-214-800-11	METAL	2.2	1%	1/2W	
R33	1-214-800-11	METAL	2.2	1%	1/2W	
R34	1-215-429-00	METAL	2.2K	1%	1/4W	
R35	1-215-421-00	METAL	1K	1%	1/4W	
R36	1-215-898-11	METAL OXIDE	10K	5%	2W	F
R37	1-249-433-11	CARBON	22K	5%	1/4W	
R38	1-249-417-11	CARBON	1K	5%	1/4W	
R39	1-249-441-11	CARBON	100K	5%	1/4W	
R40	1-249-429-11	CARBON	10K	5%	1/4W	
R41	1-249-429-11	CARBON	10K	5%	1/4W	
R42	1-249-429-11	CARBON	10K	5%	1/4W	
R43	1-249-429-11	CARBON	10K	5%	1/4W	
R44	1-249-429-11	CARBON	10K	5%	1/4W	
R45	1-249-417-11	CARBON	1K	5%	1/4W	
R46	1-249-433-11	CARBON	22K	5%	1/4W	
R47	1-249-433-11	CARBON	22K	5%	1/4W	
R48	1-249-429-11	CARBON	10K	5%	1/4W	
R49	1-249-429-11	CARBON	10K	5%	1/4W	
R50	1-249-437-11	CARBON	47K	5%	1/4W	
R51	1-249-417-11	CARBON	1K	5%	1/4W	
R52	1-249-417-11	CARBON	1K	5%	1/4W	
R53	1-249-437-11	CARBON	47K	5%	1/4W	
R54	1-249-417-11	CARBON	1K	5%	1/4W	
R55	1-215-883-11	METAL OXIDE	33	5%	2W	F
R56	1-249-433-11	CARBON	22K	5%	1/4W	
R57	1-249-429-11	CARBON	10K	5%	1/4W	
R58	1-249-417-11	CARBON	1K	5%	1/4W	
R59	1-216-449-11	METAL OXIDE	56	5%	2W	F
R61	1-215-463-00	METAL	56K	1%	1/4W	
R62	1-215-463-00	METAL	56K	1%	1/4W	
R63	1-215-463-00	METAL	56K	1%	1/4W	
R64	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R65	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R66	1-249-421-11	CARBON	2.2K	5%	1/4W	
R67	1-249-429-11	CARBON	10K	5%	1/4W	
R68	1-249-433-11	CARBON	22K	5%	1/4W	
R69	1-249-429-11	CARBON	10K	5%	1/4W	
R73	1-249-441-11	CARBON	100K	5%	1/4W	
R74	1-249-429-11	CARBON	10K	5%	1/4W	
R75	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R76	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R77	1-249-417-11	CARBON	1K	5%	1/4W	
R79	1-249-429-11	CARBON	10K	5%	1/4W	
R80	1-249-393-11	CARBON	10	5%	1/4W	
R81	1-249-393-11	CARBON	10	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R82	1-249-429-11	CARBON	10K	5%	1/4W	
R101	1-249-417-11	CARBON	1K	5%	1/4W	
R102	1-249-417-11	CARBON	1K	5%	1/4W	
R103	1-249-419-11	CARBON	1.5K	5%	1/4W	
R104	1-249-429-11	CARBON	10K	5%	1/4W	
R105	1-249-425-11	CARBON	4.7K	5%	1/4W	
R106	1-249-417-11	CARBON	1K	5%	1/4W	
R107	1-249-393-11	CARBON	10	5%	1/4W	F
R108	1-249-393-11	CARBON	10	5%	1/4W	F
R109	1-249-405-11	CARBON	100	5%	1/4W	
R110	1-249-393-11	CARBON	10	5%	1/4W	
R111	1-249-417-11	CARBON	1K	5%	1/4W	
R112	1-249-393-11	CARBON	10	5%	1/4W	F
R113	1-249-393-11	CARBON	10	5%	1/4W	F
R114	1-249-405-11	CARBON	100	5%	1/4W	
R115	1-249-393-11	CARBON	10	5%	1/4W	
R201	1-215-425-00	METAL	1.5K	1%	1/4W	
R202	1-215-445-00	METAL	10K	1%	1/4W	
R203	1-215-421-00	METAL	1K	1%	1/4W	
R204	1-215-417-00	METAL	680	1%	1/4W	
R205	1-215-439-00	METAL	5.6K	1%	1/4W	
R206	1-215-421-00	METAL	1K	1%	1/4W	
R207	1-215-421-00	METAL	1K	1%	1/4W	
R208	1-214-814-11	METAL	8.2	1%	1/2W	
R209	1-214-814-11	METAL	8.2	1%	1/2W	
R210	1-214-814-11	METAL	8.2	1%	1/2W	
R211	1-214-814-11	METAL	8.2	1%	1/2W	
R212	1-214-814-11	METAL	8.2	1%	1/2W	
R213	1-214-814-11	METAL	8.2	1%	1/2W	
R214	1-249-435-11	CARBON	33K	5%	1/4W	
R215	1-249-426-11	CARBON	5.6K	5%	1/4W	
R216	1-249-415-11	CARBON	680	5%	1/4W	F
R217	1-249-427-11	CARBON	6.8K	5%	1/4W	
R218	1-249-407-11	CARBON	150	5%	1/4W	
R219	1-249-403-11	CARBON	68	5%	1/4W	F
R221	1-216-369-00	METAL OXIDE	1	5%	2W	F
R222	1-216-369-00	METAL OXIDE	1	5%	2W	F
R223	1-215-885-00	METAL OXIDE	68	5%	2W	F
R224	1-215-425-00	METAL	1.5K	1%	1/4W	
R225	1-215-445-00	METAL	10K	1%	1/4W	
R226	1-215-421-00	METAL	1K	1%	1/4W	
R227	1-215-417-00	METAL	680	1%	1/4W	
R228	1-215-439-00	METAL	5.6K	1%	1/4W	
R229	1-215-421-00	METAL	1K	1%	1/4W	
R230	1-215-421-00	METAL	1K	1%	1/4W	
R231	1-214-814-11	METAL	8.2	1%	1/2W	
R232	1-214-814-11	METAL	8.2	1%	1/2W	
R233	1-214-814-11	METAL	8.2	1%	1/2W	
R234	1-214-814-11	METAL	8.2	1%	1/2W	
R235	1-214-814-11	METAL	8.2	1%	1/2W	
R236	1-214-814-11	METAL	8.2	1%	1/2W	
R237	1-249-435-11	CARBON	33K	5%	1/4W	
R238	1-249-426-11	CARBON	5.6K	5%	1/4W	
R239	1-249-415-11	CARBON	680	5%	1/4W	F
R240	1-249-427-11	CARBON	6.8K	5%	1/4W	
R241	1-249-407-11	CARBON	150	5%	1/4W	
R242	1-249-403-11	CARBON	68	5%	1/4W	F
R244	1-216-369-00	METAL OXIDE	1	5%	2W	F
R245	1-216-369-00	METAL OXIDE	1	5%	2W	F
R246	1-215-885-00	METAL OXIDE	68	5%	2W	F
R247	1-215-425-00	METAL	1.5K	1%	1/4W	
R248	1-215-445-00	METAL	10K	1%	1/4W	
R249	1-215-421-00	METAL	1K	1%	1/4W	
R250	1-215-417-00	METAL	680	1%	1/4W	
R251	1-215-439-00	METAL	5.6K	1%	1/4W	
R252	1-215-421-00	METAL	1K	1%	1/4W	
R253	1-215-421-00	METAL	1K	1%	1/4W	
R254	1-214-814-11	METAL	8.2	1%	1/2W	
R255	1-214-814-11	METAL	8.2	1%	1/2W	
R256	1-214-814-11	METAL	8.2	1%	1/2W	
R257	1-214-814-11	METAL	8.2	1%	1/2W	
R258	1-214-814-11	METAL	8.2	1%	1/2W	
R259	1-214-814-11	METAL	8.2	1%	1/2W	
R260	1-249-435-11	CARBON	33K	5%	1/4W	
R261	1-249-426-11	CARBON	5.6K	5%	1/4W	
R262	1-249-415-11	CARBON	680	5%	1/4W	F
R263	1-249-427-11	CARBON	6.8K	5%	1/4W	
R264	1-249-407-11	CARBON	150	5%	1/4W	
R265	1-249-403-11	CARBON	68	5%	1/4W	F
R267	1-216-369-00	METAL OXIDE	1	5%	2W	F
R268	1-216-369-00	METAL OXIDE	1	5%	2W	F
R269	1-215-885-00	METAL OXIDE	68	5%	2W	F
R270	1-249-405-11	CARBON	100	5%	1/4W	
R271	1-249-405-11	CARBON	100	5%	1/4W	
R272	1-249-405-11	CARBON	100	5%	1/4W	
R273	1-249-405-11	CARBON	100	5%	1/4W	
R274	1-249-405-11	CARBON	100	5%	1/4W	
R275	1-249-405-11	CARBON	100	5%	1/4W	
R301	1-215-427-00	METAL	1.8K	1%	1/4W	
R302	1-215-445-00	METAL	10K	1%	1/4W	
R303	1-215-421-00	METAL	1K	1%	1/4W	
R304	1-215-411-00	METAL	390	1%	1/4W	
R305	1-215-435-00	METAL	3.9K	1%	1/4W	
R306	1-215-421-00	METAL	1K	1%	1/4W	
R307	1-215-421-00	METAL	1K	1%	1/4W	
R308	1-214-808-11	METAL	4.7	1%	1/2W	
R309	1-214-808-11	METAL	4.7	1%	1/2W	
R310	1-214-808-11	METAL	4.7	1%	1/2W	
R311	1-214-808-11	METAL	4.7	1%	1/2W	
R312	1-214-808-11	METAL	4.7	1%	1/2W	
R313	1-214-808-11	METAL	4.7	1%	1/2W	
R314	1-249-435-11	CARBON	33K	5%	1/4W	
R315	1-249-426-11	CARBON	5.6K	5%	1/4W	
R316	1-249-415-11	CARBON	680	5%	1/4W	F
R317	1-249-427-11	CARBON	6.8K	5%	1/4W	
R318	1-249-407-11	CARBON	150	5%	1/4W	
R319	1-249-403-11	CARBON	68	5%	1/4W	F
R321	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R322	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R323	1-215-885-00	METAL OXIDE	68	5%	2W	F
R324	1-215-427-00	METAL	1.8K	1%	1/4W	
R325	1-215-445-00	METAL	10K	1%	1/4W	
R326	1-215-421-00	METAL	1K	1%	1/4W	
R327	1-215-411-00	METAL	390	1%	1/4W	
R328	1-215-435-00	METAL	3.9K	1%	1/4W	
R329	1-215-421-00	METAL	1K	1%	1/4W	
R330	1-215-421-00	METAL	1K	1%	1/4W	
R331	1-214-808-11	METAL	4.7	1%	1/2W	
R332	1-214-808-11	METAL	4.7	1%	1/2W	
R333	1-214-808-11	METAL	4.7	1%	1/2W	
R334	1-214-808-11	METAL	4.7	1%	1/2W	
R335	1-214-808-11	METAL	4.7	1%	1/2W	
R336	1-214-808-11	METAL	4.7	1%	1/2W	
R337	1-249-435-11	CARBON	33K	5%	1/4W	
R338	1-249-426-11	CARBON	5.6K	5%	1/4W	
R339	1-249-415-11	CARBON	680	5%	1/4W	F
R340	1-249-427-11	CARBON	6.8K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R341	1-249-407-11	CARBON	150	5%	1/4W	
R342	1-249-403-11	CARBON	68	5%	1/4W	F
R344	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R345	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R346	1-215-885-00	METAL OXIDE	68	5%	2W	F
R347	1-215-427-00	METAL	1.8K	1%	1/4W	
R348	1-215-445-00	METAL	10K	1%	1/4W	
R349	1-215-421-00	METAL	1K	1%	1/4W	
R350	1-215-411-00	METAL	390	1%	1/4W	
R351	1-215-435-00	METAL	3.9K	1%	1/4W	
R352	1-215-421-00	METAL	1K	1%	1/4W	
R353	1-215-421-00	METAL	1K	1%	1/4W	
R354	1-214-808-11	METAL	4.7	1%	1/2W	
R355	1-214-808-11	METAL	4.7	1%	1/2W	
R356	1-214-808-11	METAL	4.7	1%	1/2W	
R357	1-214-808-11	METAL	4.7	1%	1/2W	
R358	1-214-808-11	METAL	4.7	1%	1/2W	
R359	1-214-808-11	METAL	4.7	1%	1/2W	
R360	1-249-435-11	CARBON	33K	5%	1/4W	
R361	1-249-426-11	CARBON	5.6K	5%	1/4W	
R362	1-249-415-11	CARBON	680	5%	1/4W	F
R363	1-249-427-11	CARBON	6.8K	5%	1/4W	
R364	1-249-404-00	CARBON	82	5%	1/4W	
R365	1-249-400-11	CARBON	39	5%	1/4W	F
R367	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R368	1-216-363-00	METAL OXIDE	0.33	5%	2W	F
R369	1-215-885-00	METAL OXIDE	68	5%	2W	F
R370	1-249-405-11	CARBON	100	5%	1/4W	
R371	1-249-405-11	CARBON	100	5%	1/4W	
R372	1-249-405-11	CARBON	100	5%	1/4W	
R373	1-249-405-11	CARBON	100	5%	1/4W	
R374	1-249-405-11	CARBON	100	5%	1/4W	
R375	1-249-405-11	CARBON	100	5%	1/4W	

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*A-1346-005-A E BOARD, COMPLETE
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*1-508-742-00 PIN, CONNECTOR 3P
*1-508-786-00 PIN, CONNECTOR (5MM PITCH) 2P
*1-564-509-11 PLUG, CONNECTOR 6P
*1-564-514-11 PLUG, CONNECTOR 11P
*1-564-516-11 PLUG, CONNECTOR 13P

*1-580-798-11 CONNECTOR PIN (DY) 6P
*4-341-751-01 EYELET
*4-341-752-01 EYELET (EY100,EY101)
4-382-854-11 SCREW (M3X10), P, SW (+)

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C1	1-126-899-11	ELECT	3900MF	20%	16V
C2	1-126-899-11	ELECT	3900MF	20%	16V
C3	1-126-899-11	ELECT	3900MF	20%	16V
C4	1-102-824-00	CERAMIC	470PF	5%	50V
C5	1-136-153-00	FILM	0.01MF	5%	50V
C6	1-102-824-00	CERAMIC	470PF	5%	50V
C7	1-102-824-00	CERAMIC	470PF	5%	50V
C8	1-136-153-00	FILM	0.01MF	5%	50V
C9	1-102-824-00	CERAMIC	470PF	5%	50V
C10	1-136-153-00	FILM	0.01MF	5%	50V
C11	1-102-824-00	CERAMIC	470PF	5%	50V
C12	1-102-824-00	CERAMIC	470PF	5%	50V
C13	1-130-908-00	FILM	0.0039MF	3%	1.6KV
C14	1-130-908-00	FILM	0.0039MF	3%	1.6KV
C15	1-124-585-11	ELECT	3300MF	20%	10V
C16	1-124-585-11	ELECT	3300MF	20%	10V
C17	1-123-935-00	ELECT	33MF	20%	160V
C18	1-129-996-00	FILM	0.22MF	20%	630V
C19	1-124-585-11	ELECT	3300MF	20%	10V
C21	1-136-945-11	FILM	8.2MF	5%	200V
C22	1-136-945-11	FILM	8.2MF	5%	200V
C23	1-136-945-11	FILM	8.2MF	5%	200V
C24	1-136-945-11	FILM	8.2MF	5%	200V
C30	1-136-613-11	FILM	0.0068MF	3%	2KV
C31	1-106-391-12	MYLAR	0.1MF	10%	200V
C32	1-124-907-11	ELECT	10MF	20%	50V
C35	1-102-244-00	CERAMIC	220PF	10%	500V
C36	1-164-747-11	CERAMIC	330PF	15%	1.5KV
C37	1-164-747-11	CERAMIC	330PF	15%	1.5KV
C38	1-164-747-11	CERAMIC	330PF	15%	1.5KV
C101	1-102-973-00	CERAMIC	100PF	5%	50V
C102	1-136-171-00	FILM	0.033MF	5%	50V
C104	1-136-165-00	FILM	0.1MF	5%	50V
C105	1-136-165-00	FILM	0.1MF	5%	50V
C106	1-126-101-11	ELECT	100MF	20%	16V
C109	1-124-903-11	ELECT	1MF	20%	50V
C110	1-126-101-11	ELECT	100MF	20%	16V
C111	1-126-101-11	ELECT	100MF	20%	16V
C112	1-126-101-11	ELECT	100MF	20%	16V
C113	1-126-233-11	ELECT	22MF	20%	50V
C114	1-124-499-11	ELECT	1MF	20%	50V
C115	1-136-153-00	FILM	0.01MF	5%	50V
C116	1-130-475-00	MYLAR	0.0022MF	5%	50V
C117	1-102-973-00	CERAMIC	100PF	5%	50V
C118	1-136-165-00	FILM	0.1MF	5%	50V
C119	1-126-101-11	ELECT	100MF	20%	16V
C120	1-123-939-00	ELECT	10MF	20%	200V
C121	1-136-171-00	FILM	0.033MF	5%	50V
C122	1-123-024-21	ELECT	33MF		160V
C123	1-123-024-21	ELECT	33MF		160V
C124	1-125-499-11	ELECT(BLOCK)	220MF	20%	200V
C125	1-136-153-00	FILM	0.01MF	5%	50V
C126	1-130-471-00	MYLAR	0.001MF	5%	50V
C128	1-123-939-00	ELECT	10MF	20%	200V
C129	1-123-939-00	ELECT	10MF	20%	200V
C130	1-124-120-11	ELECT	220MF	20%	16V
C131	1-124-120-11	ELECT	220MF	20%	16V
C132	1-123-024-21	ELECT	33MF		160V
C133	1-124-499-11	ELECT	1MF	20%	50V
C134	1-124-478-11	ELECT	100MF	20%	25V
C135	1-124-478-11	ELECT	100MF	20%	25V
C136	1-126-233-11	ELECT	22MF	20%	50V
C137	1-102-973-00	CERAMIC	100PF	5%	50V
C138	1-124-907-11	ELECT	10MF	20%	50V
C139	1-124-360-00	ELECT	1000MF	20%	16V
C140	1-136-169-00	FILM	0.22MF	5%	50V
C141	1-130-471-00	MYLAR	0.001MF	5%	50V
C142	1-125-499-11	ELECT(BLOCK)	220MF	20%	200V
C143	1-102-824-00	CERAMIC	470PF	5%	50V
C144	1-136-165-00	FILM	0.1MF	5%	50V
C145	1-136-153-00	FILM	0.01MF	5%	50V
C146	1-136-173-00	FILM	0.47MF	5%	50V
C147	1-136-173-00	FILM	0.47MF	5%	50V
C148	1-126-101-11	ELECT	100MF	20%	16V
C149	1-124-907-11	ELECT	10MF	20%	50V
C150	1-130-471-00	MYLAR	0.001MF	5%	50V
C151	1-124-903-11	ELECT	1MF	20%	50V
C152	1-136-165-00	FILM	0.1MF	5%	50V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C153	1-124-034-51	ELECT	33MF	20%	16V
C154	1-136-165-00	FILM	0.1MF	5%	50V
C155	1-136-153-00	FILM	0.01MF	5%	50V
C156	1-136-165-00	FILM	0.1MF	5%	50V
C157	1-163-157-00	FILM	0.022MF	5%	50V
C158	1-124-046-00	ELECT	10MF		160V
C159	1-136-111-00	FILM	1MF	5%	200V
C160	1-136-111-00	FILM	1MF	5%	200V
C161	1-124-903-11	ELECT	1MF	20%	50V
C162	1-136-111-00	FILM	1MF	5%	200V
C163	1-124-907-11	ELECT	10MF	20%	50V
C164	1-124-907-11	ELECT	10MF	20%	50V
C165	1-124-907-11	ELECT	10MF	20%	50V
C166	1-124-907-11	ELECT	10MF	20%	50V
C167	1-102-824-00	CERAMIC	470PF	5%	50V
C168	1-136-153-00	FILM	0.01MF	5%	50V
C169	1-124-768-11	ELECT	4.7MF	20%	50V
C170	1-124-034-51	ELECT	33MF	20%	16V
C171	1-136-165-00	FILM	0.1MF	5%	50V
C172	1-124-907-11	ELECT	10MF	20%	50V
C173	1-124-034-51	ELECT	33MF	20%	16V
C174	1-124-034-51	ELECT	33MF	20%	16V
C175	1-130-706-00	FILM	0.008MF	3%	1.6KV
C176	1-106-391-12	MYLAR	0.1MF	10%	200V
C177	1-124-907-11	ELECT	10MF	20%	50V
C178	1-101-004-00	CERAMIC	0.01MF		50V

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D1	8-719-970-89	DIODE DD50R	
D7	8-719-908-20	DIODE ERC88-009	
D8	8-719-908-20	DIODE ERC88-009	
D9	8-719-979-58	DIODE EGP10D	
D10	8-719-979-58	DIODE EGP10D	
D11	8-719-901-19	DIODE V11N	
D12	8-719-979-58	DIODE EGP10D	
D13	8-719-945-80	DIODE ERC06-15S	
D14	8-719-900-95	DIODE V09G	
D15	8-719-933-02	DIODE ERD33-02	
D103	8-719-911-19	DIODE 1SS119	
D104	8-719-911-19	DIODE 1SS119	
D105	8-719-948-45	DIODE ERA22-08	
D106	8-719-948-45	DIODE ERA22-08	
D107	8-719-911-19	DIODE 1SS119	
D109	8-719-948-45	DIODE ERA22-08	
D110	8-719-911-19	DIODE 1SS119	
D111	8-719-911-19	DIODE 1SS119	
D112	8-719-900-26	DIODE ERD29-08J	
D113	8-719-911-19	DIODE 1SS119	
D114	8-719-110-53	DIODE RD20ES-B2	
D115	8-719-110-53	DIODE RD20ES-B2	
D116	8-719-920-67	DIODE ERC91-02	
D117	8-719-911-19	DIODE 1SS119	
D118	8-719-948-45	DIODE ERA22-08	
D119	8-719-911-19	DIODE 1SS119	
D120	8-719-911-19	DIODE 1SS119	
D121	8-719-911-19	DIODE 1SS119	
D122	8-719-911-19	DIODE 1SS119	
D123	8-719-911-19	DIODE 1SS119	
D124	8-719-948-45	DIODE ERA22-08	
D126	8-719-110-88	DIODE RD39ES-B2	
D127	8-719-110-41	DIODE RD15ES-B2	
D128	8-719-110-41	DIODE RD15ES-B2	
D129	8-719-110-41	DIODE RD15ES-B2	
D130	8-719-110-41	DIODE RD15ES-B2	
D131	8-719-911-19	DIODE 1SS119	
D132	8-719-911-19	DIODE 1SS119	
D133	8-719-911-19	DIODE 1SS119	
D134	8-719-300-80	DIODE RU-1C	
D135	8-719-300-80	DIODE RU-1C	
D136	8-719-300-80	DIODE RU-1C	
D137	8-719-300-80	DIODE RU-1C	
D138	8-719-911-19	DIODE 1SS119	
D139	8-719-911-19	DIODE 1SS119	
D140	8-719-911-19	DIODE 1SS119	
D141	8-719-911-19	DIODE 1SS119	
D142	8-719-911-19	DIODE 1SS119	
D143	8-719-911-19	DIODE 1SS119	
D144	8-719-901-19	DIODE V11N	
D145	8-719-911-19	DIODE 1SS119	
D146	8-719-948-45	DIODE ERA22-08	
D149	8-719-911-19	DIODE 1SS119	

<FERRITE BEAD INDUCTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
FB1	1-410-396-41	FERRITE BEAD INDUCTOR	
FB2	1-410-396-41	FERRITE BEAD INDUCTOR	
FB3	1-410-396-41	FERRITE BEAD INDUCTOR	
FB4	1-410-396-41	FERRITE BEAD INDUCTOR	
FB5	1-410-396-41	FERRITE BEAD INDUCTOR	
FB6	1-410-396-41	FERRITE BEAD INDUCTOR	
FB7	1-410-396-41	FERRITE BEAD INDUCTOR	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC1	8-759-145-58	IC UPC4558C	
IC2	8-759-145-58	IC UPC4558C	
IC3	8-759-145-58	IC UPC4558C	
IC101	8-759-345-38	IC HD14538BP	
IC103	8-759-109-82	IC UPC814C	
IC104	8-759-145-58	IC UPC4558C	
IC105	8-759-145-58	IC UPC4558C	
IC106	8-759-145-58	IC UPC4558C	
IC107	8-759-014-95	IC MC1495L	
IC108	8-759-145-58	IC UPC4558C	
IC109	8-759-929-62	IC LM7812CT	
IC110	8-759-929-65	IC LM7912CT	
IC111	8-759-100-75	IC UPC1394C	
IC112	8-759-145-58	IC UPC4558C	
IC113	8-759-987-16	IC LM393P	
IC114	8-759-987-16	IC LM393P	

<COIL>

REF.NO.	PART NO.	DESCRIPTION		REMARK
L100	1-459-483-00	COIL (WITH CORE)		
L102	1-459-155-00	COIL (WITH CORE)	45UH	
L103	1-459-155-00	COIL (WITH CORE)	45UH	
L104	1-459-155-00	COIL (WITH CORE)	45UH	
L106	1-459-483-00	COIL (WITH CORE)		
L107	1-410-093-11	INDUCTOR	33MMH	
L108	1-410-093-11	INDUCTOR	33MMH	
L109	1-459-104-00	COIL, DUST CORE		
L110	1-459-104-00	COIL, DUST CORE		
L111	1-410-093-11	INDUCTOR	33MMH	
L112	1-460-022-11	COIL, CHOKE 1.3MMH		
L113	1-410-680-31	INDUCTOR	330UH	
L114	1-410-686-11	INDUCTOR	1MMH	

REF.NO.	PART NO.	DESCRIPTION				REMARK
L115	1-407-500-00	INDUCTOR	4.7MMH			

<VARIABLE COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
LV1	1-460-019-11	COIL, HORIZONTAL ADJUSTMENT	
LV2	1-460-019-11	COIL, HORIZONTAL ADJUSTMENT	
LV3	1-460-019-11	COIL, HORIZONTAL ADJUSTMENT	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q1	8-729-142-69	TRANSISTOR 2SK817	
Q2	8-729-142-68	TRANSISTOR 2SJ143	
Q3	8-729-142-69	TRANSISTOR 2SK817	
Q4	8-729-142-68	TRANSISTOR 2SJ143	
Q5	8-729-142-69	TRANSISTOR 2SK817	
Q6	8-729-142-68	TRANSISTOR 2SJ143	
Q7	8-729-820-71	TRANSISTOR 2SC3998CA	
Q21	8-729-802-07	TRANSISTOR 2SD1403-CA	
Q22	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q101	8-729-105-74	TRANSISTOR 2SK523-M1	
Q102	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q103	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q104	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q106	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q107	8-729-140-96	TRANSISTOR 2SD774-34	
Q108	8-729-140-97	TRANSISTOR 2SB734-34	
Q109	8-729-105-74	TRANSISTOR 2SK523-M1	
Q110	8-729-143-42	TRANSISTOR 2SK929	
Q111	8-729-143-42	TRANSISTOR 2SK929	
Q112	8-729-142-68	TRANSISTOR 2SJ143	
Q113	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q115	8-729-926-42	TRANSISTOR XDC114ES	
Q116	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q117	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q118	8-729-105-74	TRANSISTOR 2SK523-M1	
Q120	8-729-802-71	TRANSISTOR 2SA1407-D	
Q121	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q127	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q128	8-729-926-42	TRANSISTOR XDC114ES	
Q129	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q130	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q131	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q132	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q133	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q134	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q135	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q136	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q137	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q138	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q139	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q140	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q141	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q142	8-729-143-42	TRANSISTOR 2SK929	
Q143	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q144	8-729-905-86	TRANSISTOR 2SC4054N	
Q145	8-729-402-03	TRANSISTOR 2SK755	
Q146	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q147	8-729-905-86	TRANSISTOR 2SC4054N	
Q148	8-729-802-71	TRANSISTOR 2SA1407-D	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-216-393-00	METAL OXIDE	2.2	5%	3W	F
R2	1-216-393-00	METAL OXIDE	2.2	5%	3W	F
R3	1-216-393-00	METAL OXIDE	2.2	5%	3W	F
R4	1-249-417-11	CARBON	1K	5%	1/4W	
R5	1-215-445-00	METAL	10K	1%	1/4W	
R7	1-215-445-00	METAL	10K	1%	1/4W	
R8	1-215-445-00	METAL	10K	1%	1/4W	
R9	1-215-445-00	METAL	10K	1%	1/4W	
R10	1-249-417-11	CARBON	1K	5%	1/4W	
R11	1-214-824-11	METAL	22	1%	1/2W	
R12	1-214-824-11	METAL	22	1%	1/2W	
R13	1-214-824-11	METAL	22	1%	1/2W	
R14	1-249-417-11	CARBON	1K	5%	1/4W	
R15	1-215-445-00	METAL	10K	1%	1/4W	
R17	1-215-445-00	METAL	10K	1%	1/4W	
R18	1-215-445-00	METAL	10K	1%	1/4W	
R19	1-215-445-00	METAL	10K	1%	1/4W	
R20	1-249-417-11	CARBON	1K	5%	1/4W	
R21	1-214-832-00	METAL	47	1%	1/2W	
R22	1-214-832-00	METAL	47	1%	1/2W	
R23	1-214-832-00	METAL	47	1%	1/2W	
R24	1-249-417-11	CARBON	1K	5%	1/4W	
R25	1-215-445-00	METAL	10K	1%	1/4W	
R27	1-215-445-00	METAL	10K	1%	1/4W	
R28	1-215-445-00	METAL	10K	1%	1/4W	
R29	1-215-445-00	METAL	10K	1%	1/4W	
R30	1-249-417-11	CARBON	1K	5%	1/4W	
R31	1-214-824-11	METAL	22	1%	1/2W	
R32	1-214-824-11	METAL	22	1%	1/2W	
R33	1-214-824-11	METAL	22	1%	1/2W	
R34	1-214-824-11	METAL	22	1%	1/2W	
R35	1-214-824-11	METAL	22	1%	1/2W	
R36	1-214-824-11	METAL	22	1%	1/2W	
R37	1-214-832-00	METAL	47	1%	1/2W	
R38	1-214-832-00	METAL	47	1%	1/2W	
R39	1-214-832-00	METAL	47	1%	1/2W	
R40	1-214-824-11	METAL	22	1%	1/2W	
R41	1-214-824-11	METAL	22	1%	1/2W	
R42	1-214-824-11	METAL	22	1%	1/2W	
R51	1-249-479-11	CARBON	2.7	5%	1/2W	F
R52	1-249-479-11	CARBON	2.7	5%	1/2W	F
R53	1-249-479-11	CARBON	2.7	5%	1/2W	F
R54	1-215-857-11	METAL OXIDE	10	5%	1W	F
R55	1-215-924-00	METAL OXIDE	15K	5%	3W	F
R56	1-247-716-11	CARBON	1.8K	5%	1/4W	F
R57	1-249-405-11	CARBON	100	5%	1/4W	
R58	1-249-405-11	CARBON	100	5%	1/4W	
R59	1-249-405-11	CARBON	100	5%	1/4W	
R60	1-249-405-11	CARBON	100	5%	1/4W	
R61	1-249-405-11	CARBON	100	5%	1/4W	
R62	1-249-405-11	CARBON	100	5%	1/4W	
R63	1-247-712-11	CARBON	820	5%	1/4W	F
R64	1-247-712-11	CARBON	820	5%	1/4W	F
R65	1-247-712-11	CARBON	820	5%	1/4W	F
R66	1-215-905-11	METAL OXIDE	10	5%	3W	F
R67	1-216-397-11	METAL OXIDE	4.7	5%	3W	F
R68	1-216-397-11	METAL OXIDE	4.7	5%	3W	F
R69	1-216-397-11	METAL OXIDE	4.7	5%	3W	F
R101	1-215-457-00	METAL	33K	1%	1/4W	
R102	1-249-429-11	CARBON	10K	5%	1/4W	
R103	1-249-429-11	CARBON	10K	5%	1/4W	
R109	1-249-429-11	CARBON	10K	5%	1/4W	
R110	1-249-417-11	CARBON	1K	5%	1/4W	
R111	1-249-429-11	CARBON	10K	5%	1/4W	
R112	1-249-425-11	CARBON	4.7K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R113	1-249-405-11	CARBON	100	5%	1/4W	
R114	1-249-417-11	CARBON	1K	5%	1/4W	
R115	1-215-445-00	METAL	10K	1%	1/4W	
R116	1-215-445-00	METAL	10K	1%	1/4W	
R117	1-215-433-00	METAL	3.3K	1%	1/4W	
R118	1-249-423-11	CARBON	3.3K	5%	1/4W	
R119	1-215-457-00	METAL	33K	1%	1/4W	
R120	1-215-457-00	METAL	33K	1%	1/4W	
R121	1-215-445-00	METAL	10K	1%	1/4W	
R122	1-249-425-11	CARBON	4.7K	5%	1/4W	
R123	1-215-445-00	METAL	10K	1%	1/4W	
R124	1-215-445-00	METAL	10K	1%	1/4W	
R125	1-215-457-00	METAL	33K	1%	1/4W	
R126	1-215-457-00	METAL	33K	1%	1/4W	
R127	1-215-447-00	METAL	12K	1%	1/4W	
R128	1-215-445-00	METAL	10K	1%	1/4W	
R129	1-215-447-00	METAL	12K	1%	1/4W	
R130	1-249-425-11	CARBON	4.7K	5%	1/4W	
R131	1-215-445-00	METAL	10K	1%	1/4W	
R132	1-215-449-00	METAL	15K	1%	1/4W	
R133	1-249-425-11	CARBON	4.7K	5%	1/4W	
R134	1-215-453-00	METAL	22K	1%	1/4W	
R135	1-249-429-11	CARBON	10K	5%	1/4W	
R136	1-249-423-11	CARBON	3.3K	5%	1/4W	
R137	1-249-423-11	CARBON	3.3K	5%	1/4W	
R138	1-249-423-11	CARBON	3.3K	5%	1/4W	
R139	1-249-425-11	CARBON	4.7K	5%	1/4W	
R140	1-249-417-11	CARBON	1K	5%	1/4W	
R141	1-249-421-11	CARBON	2.2K	5%	1/4W	
R142	1-249-421-11	CARBON	2.2K	5%	1/4W	
R143	1-249-420-11	CARBON	1.8K	5%	1/4W	
R144	1-249-421-11	CARBON	2.2K	5%	1/4W	
R145	1-249-423-11	CARBON	3.3K	5%	1/4W	
R146	1-249-435-11	CARBON	33K	5%	1/4W	
R147	1-249-421-11	CARBON	2.2K	5%	1/4W	
R148	1-249-440-11	CARBON	82K	5%	1/4W	
R149	1-249-417-11	CARBON	1K	5%	1/4W	
R150	1-215-461-00	METAL	47K	1%	1/4W	
R151	1-249-425-11	CARBON	4.7K	5%	1/4W	
R152	1-215-445-00	METAL	10K	1%	1/4W	
R153	1-215-445-00	METAL	10K	1%	1/4W	
R154	1-247-895-00	CARBON	470K	5%	1/4W	
R155	1-249-420-11	CARBON	1.8K	5%	1/4W	
R156	1-249-437-11	CARBON	47K	5%	1/4W	
R157	1-249-413-11	CARBON	470	5%	1/4W	
R158	1-249-405-11	CARBON	100	5%	1/4W	
R159	1-249-405-11	CARBON	100	5%	1/4W	
R160	1-249-417-11	CARBON	1K	5%	1/4W	
R161	1-215-467-00	METAL	82K	1%	1/4W	
R162	1-215-866-11	METAL OXIDE	330	5%	1W	F
R163	1-215-461-00	METAL	47K	1%	1/4W	
R164	1-249-421-11	CARBON	2.2K	5%	1/4W	
R165	1-215-445-00	METAL	10K	1%	1/4W	
R166	1-249-429-11	CARBON	10K	5%	1/4W	
R167	1-249-437-11	CARBON	47K	5%	1/4W	
R168	1-249-429-11	CARBON	10K	5%	1/4W	
R169	1-247-725-11	CARBON	10K	5%	1/4W	F
R170	1-249-425-11	CARBON	4.7K	5%	1/4W	
R171	1-249-417-11	CARBON	1K	5%	1/4W	
R172	1-249-417-11	CARBON	1K	5%	1/4W	
R173	1-216-389-11	METAL OXIDE	1	5%	3W	F
R174	1-216-388-11	METAL OXIDE	0.82	5%	3W	F
R176	1-247-713-11	CARBON	1K	5%	1/4W	F
R177	1-215-445-00	METAL	10K	1%	1/4W	
R178	1-249-417-11	CARBON	1K	5%	1/4W	
R179	1-249-429-11	CARBON	10K	5%	1/4W	
R180	1-215-433-00	METAL	3.3K	1%	1/4W	
R181	1-249-441-11	CARBON	100K	5%	1/4W	
R182	1-249-421-11	CARBON	2.2K	5%	1/4W	
R183	1-249-405-11	CARBON	100	5%	1/4W	
R184	1-249-425-11	CARBON	4.7K	5%	1/4W	
R186	1-249-437-11	CARBON	47K	5%	1/4W	
R187	1-215-461-00	METAL	47K	1%	1/4W	
R191	1-249-423-11	CARBON	3.3K	5%	1/4W	
R192	1-249-433-11	CARBON	22K	5%	1/4W	
R193	1-247-903-00	CARBON	1M	5%	1/4W	
R194	1-249-423-11	CARBON	3.3K	5%	1/4W	
R195	1-249-423-11	CARBON	3.3K	5%	1/4W	
R196	1-247-883-00	CARBON	150K	5%	1/4W	
R197	1-249-405-11	CARBON	100	5%	1/4W	
R198	1-215-447-00	METAL	12K	1%	1/4W	
R199	1-249-423-11	CARBON	3.3K	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W	
R202	1-249-417-11	CARBON	1K	5%	1/4W	
R203	1-249-453-11	CARBON	3.3	5%	1/4W	F
R204	1-249-429-11	CARBON	10K	5%	1/4W	
R205	1-249-427-11	CARBON	6.8K	5%	1/4W	
R206	1-249-429-11	CARBON	10K	5%	1/4W	
R207	1-249-441-11	CARBON	100K	5%	1/4W	
R208	1-216-341-11	METAL OXIDE	0.22	5%	1W	F
R209	1-249-417-11	CARBON	1K	5%	1/4W	
R210	1-215-451-00	METAL	18K	1%	1/4W	
R212	1-249-431-11	CARBON	15K	5%	1/4W	
R213	1-249-429-11	CARBON	10K	5%	1/4W	
R214	1-215-883-11	METAL OXIDE	33	5%	2W	F
R215	1-249-417-11	CARBON	1K	5%	1/4W	
R216	1-249-423-11	CARBON	3.3K	5%	1/4W	
R217	1-249-399-11	CARBON	33	5%	1/4W	
R218	1-249-417-11	CARBON	1K	5%	1/4W	F
R219	1-215-445-00	METAL	10K	1%	1/4W	
R220	1-215-445-00	METAL	10K	1%	1/4W	
R221	1-249-476-11	CARBON	1.5	5%	1/2W	F
R222	1-249-441-11	CARBON	100K	5%	1/4W	
R223	1-249-429-11	CARBON	10K	5%	1/4W	
R224	1-249-429-11	CARBON	10K	5%	1/4W	
R225	1-249-421-11	CARBON	2.2K	5%	1/4W	
R226	1-215-445-00	METAL	10K	1%	1/4W	
R227	1-249-429-11	CARBON	10K	5%	1/4W	
R228	1-249-429-11	CARBON	10K	5%	1/4W	
R229	1-249-429-11	CARBON	10K	5%	1/4W	
R230	1-249-443-11	CARBON	0.47	5%	1/4W	F
R231	1-249-443-11	CARBON	0.47	5%	1/4W	F
R232	1-249-437-11	CARBON	47K	5%	1/4W	
R233	1-249-417-11	CARBON	1K	5%	1/4W	
R234	1-249-417-11	CARBON	1K	5%	1/4W	
R235	1-249-437-11	CARBON	47K	5%	1/4W	
R236	1-249-437-11	CARBON	47K	5%	1/4W	
R237	1-249-441-11	CARBON	100K	5%	1/4W	
R238	1-249-399-11	CARBON	33	5%	1/4W	
R239	1-249-423-11	CARBON	3.3K	5%	1/4W	
R240	1-249-441-11	CARBON	100K	5%	1/4W	
R241	1-249-437-11	CARBON	47K	5%	1/4W	
R242	1-215-461-00	METAL	47K	1%	1/4W	
R243	1-215-469-00	METAL	100K	1%	1/4W	
R244	1-249-423-11	CARBON	3.3K	5%	1/4W	
R245	1-216-441-00	METAL OXIDE	27K	5%	1W	F
R246	1-215-435-00	METAL	3.9K	1%	1/4W	

E **K**

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION				REMARK
R247	1-249-421-11	CARBON	2.2K	5%	1/4W	
R248	1-249-425-11	CARBON	4.7K	5%	1/4W	
R249	1-215-421-00	METAL	1K	1%	1/4W	
R250	1-215-445-00	METAL	10K	1%	1/4W	
R251	1-247-887-00	CARBON	220K	5%	1/4W	
R252	1-249-429-11	CARBON	10K	5%	1/4W	
R254	1-249-405-11	CARBON	100	5%	1/4W	
R255	1-249-417-11	CARBON	1K	5%	1/4W	
R256	1-249-441-11	CARBON	100K	5%	1/4W	
R257	1-249-437-11	CARBON	47K	5%	1/4W	
R258	1-215-435-00	METAL	3.9K	1%	1/4W	
R259	1-215-439-00	METAL	5.6K	1%	1/4W	
R260	1-215-445-00	METAL	10K	1%	1/4W	
R261	1-249-429-11	CARBON	10K	5%	1/4W	
R262	1-249-405-11	CARBON	100	5%	1/4W	
R263	1-215-878-00	METAL OXIDE	33K	5%	1W	F
R264	1-249-429-11	CARBON	10K	5%	1/4W	
R265	1-249-405-11	CARBON	100	5%	1/4W	
R266	1-249-441-11	CARBON	100K	5%	1/4W	
R267	1-215-379-00	METAL	18	1%	1/4W	
R268	1-215-379-00	METAL	18	1%	1/4W	
R269	1-215-421-00	METAL	1K	1%	1/4W	
R270	1-215-421-00	METAL	1K	1%	1/4W	
R271	1-215-924-00	METAL OXIDE	15K	5%	3W	F
R272	1-249-453-11	CARBON	3.3	5%	1/4W	F
R273	1-249-429-11	CARBON	10K	5%	1/4W	
R274	1-249-429-11	CARBON	10K	5%	1/4W	
R275	1-249-429-11	CARBON	10K	5%	1/4W	
R276	1-249-429-11	CARBON	10K	5%	1/4W	
R281	1-249-451-11	CARBON	2.2	5%	1/4W	F
R282	1-249-451-11	CARBON	2.2	5%	1/4W	F
R283	1-249-425-11	CARBON	4.7K	5%	1/4W	
R284	1-215-467-00	METAL	82K	1%	1/4W	
R285	1-215-445-00	METAL	10K	1%	1/4W	
R286	1-215-911-11	METAL OXIDE	100	5%	3W	F
R287	1-202-846-00	SOLID	470K	10%	1/2W	
R288	1-202-846-00	SOLID	470K	10%	1/2W	
R289	1-202-846-00	SOLID	470K	10%	1/2W	
R290	1-202-846-00	SOLID	470K	10%	1/2W	
R296	1-249-429-11	CARBON	10K	5%	1/4W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION
RV104	1-228-997-00	RES, ADJ, CARBON 100K

<TRANSFORMER>

REF.NO.	PART NO.	DESCRIPTION
T2	⚠ 1-439-479-11	TRANSFORMER, LINE OUTPUT
T3	1-437-078-00	TRANSFORMER, HORIZONTAL DRIVE
T102	⚠ 1-439-480-11	TRANSFORMER, HORIZONTAL OUTPUT
T103	1-437-144-11	TRANSFORMER, FERRITE (HDT)
T104	1-437-144-11	TRANSFORMER, FERRITE (HDT)
T105	1-424-290-11	TRANSFORMER, DRIVE

****

*A-1380-373-A K BOARD, COMPLETE
****

REF.NO.	PART NO.	DESCRIPTION
	*1-508-784-00	PIN, CONNECTOR (5MM PITCH) 1P
	*1-564-517-11	PLUG, CONNECTOR 2P
	*1-564-518-11	PLUG, CONNECTOR 3P
	*1-564-523-11	PLUG, CONNECTOR 8P
	*4-034-120-01	HOLDER (A)
	*4-341-752-01	EYELET (EY201)
	4-382-854-11	SCREW (M3X10), P, SW (+)

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C201	1-124-907-11	ELECT	10MF	20%	50V	
C202	1-124-907-11	ELECT	10MF	20%	50V	
C203	1-124-907-11	ELECT	10MF	20%	50V	
C204	1-101-004-00	CERAMIC	0.01MF		50V	
C205	1-101-004-00	CERAMIC	0.01MF		50V	
C206	1-124-907-11	ELECT	10MF	20%	50V	
C207	1-124-794-51	ELECT	4.7MF	20%	100V	
C208	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C209	1-124-903-11	ELECT	1MF	20%	50V	
C210	1-136-173-00	FILM	0.47MF	5%	50V	
C211	1-124-910-11	ELECT	47MF	20%	50V	
C212	1-124-910-11	ELECT	47MF	20%	50V	
C213	1-124-907-11	ELECT	10MF	20%	50V	
C214	1-124-907-11	ELECT	10MF	20%	50V	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D201	8-719-110-17	DIODE RD10ES-B2
D202	8-719-110-17	DIODE RD10ES-B2
D203	8-719-948-45	DIODE ERA22-08
D204	8-719-911-19	DIODE 1SS119
D205	8-719-911-19	DIODE 1SS119

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC201	8-759-109-82	IC UPC814C
IC202	8-759-109-82	IC UPC814C

<COIL>

REF.NO.	PART NO.	DESCRIPTION
L201	1-459-155-00	COIL (WITH CORE) 45UH

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q201	8-729-112-61	TRANSISTOR 2SA1441-L
Q202	8-729-207-82	TRANSISTOR 2SC3421-Y
Q203	8-729-143-42	TRANSISTOR 2SK929
Q204	8-729-143-42	TRANSISTOR 2SK929
Q205	8-729-142-74	TRANSISTOR 2SD1977
Q206	8-729-142-70	TRANSISTOR 2SB1315

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R201	1-215-429-00	METAL	2.2K	1%	1/4W	
R202	1-215-429-00	METAL	2.2K	1%	1/4W	
R203	1-215-461-00	METAL	47K	1%	1/4W	
R204	1-215-429-00	METAL	2.2K	1%	1/4W	
R205	1-249-417-11	CARBON	1K	5%	1/4W	
R206	1-215-445-00	METAL	10K	1%	1/4W	
R207	1-249-425-11	CARBON	4.7K	5%	1/4W	
R208	1-215-453-00	METAL	22K	1%	1/4W	
R209	1-215-453-00	METAL	22K	1%	1/4W	
R210	1-202-818-00	SOLID	1K	10%	1/2W	
R211	1-202-818-00	SOLID	1K	10%	1/2W	
R212	1-249-429-11	CARBON	10K	5%	1/4W	
R213	1-249-441-11	CARBON	100K	5%	1/4W	
R214	1-215-491-00	METAL	820K	1%	1/4W	
R215	1-215-902-11	METAL OXIDE	47K	5%	2W	F
R216	1-215-403-00	METAL	180	1%	1/4W	
R217	1-249-425-11	CARBON	4.7K	5%	1/4W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R218	1-249-429-11	CARBON	10K	5%	1/4W	
R219	1-247-713-11	CARBON	1K	5%	1/4W	F
R220	1-247-700-11	CARBON	100	5%	1/4W	F
R221	1-202-842-11	SOLID	220K	10%	1/2W	
R222	1-247-713-11	CARBON	1K	5%	1/4W	F
R223	1-215-904-11	METAL OXIDE	100K	5%	2W	F
R224	1-202-842-11	SOLID	220K	10%	1/2W	
R225	1-247-713-11	CARBON	1K	5%	1/4W	F
R226	1-249-389-11	CARBON	4.7	5%	1/4W	F
R227	1-249-451-11	CARBON	2.2	5%	1/4W	F
R228	1-215-429-00	METAL	2.2K	1%	1/4W	
R229	1-249-437-11	CARBON	47K	5%	1/4W	
R230	1-215-407-00	METAL	270	1%	1/4W	
R231	1-215-431-00	METAL	2.7K	1%	1/4W	
R232	1-247-700-11	CARBON	100	5%	1/4W	F
R233	1-247-700-11	CARBON	100	5%	1/4W	F
R234	1-249-447-11	CARBON	1	5%	1/4W	F
R235	1-249-447-11	CARBON	1	5%	1/4W	F
R236	1-247-713-11	CARBON	1K	5%	1/4W	F
R237	1-249-433-11	CARBON	22K	5%	1/4W	
R238	1-249-451-11	CARBON	2.2	5%	1/4W	F

<SPARK GAP>

SG201	1-519-063-XX	DISCHARGING GAP
SG202	1-519-063-XX	DISCHARGING GAP

<TRANSFORMER>

T201	1-424-287-11	TRANSFORMER, DYNAMIC FOCUS

****

*1-639-941-11 KA BOARD
****

*1-564-517-11	PLUG, CONNECTOR 2P
*1-564-520-11	PLUG, CONNECTOR 5P
4-382-854-11	SCREW (M3X10), P, SW (+)

<CAPACITOR>

C501	1-124-910-11	ELECT	47MF	20%	50V
C502	1-101-004-00	CERAMIC	0.01MF		50V
C503	1-124-907-11	ELECT	10MF	20%	50V
C504	1-124-927-11	ELECT	4.7MF	20%	50V
C505	1-101-002-00	CERAMIC	0.0022MF		50V
C506	1-124-477-11	ELECT	47MF	20%	16V
C507	1-124-477-11	ELECT	47MF	20%	16V
C508	1-126-103-11	ELECT	470MF	20%	16V
C509	1-126-103-11	ELECT	470MF	20%	16V
C510	1-136-169-00	FILM	0.22MF	5%	50V
C511	1-136-169-00	FILM	0.22MF	5%	50V
C512	1-124-557-11	ELECT	1000MF	20%	25V
C513	1-124-911-11	ELECT	220MF	20%	50V

<DIODE>

D501	8-719-900-95	DIODE V09G

<IC>

IC501	8-759-101-77	IC UPC1241H

REF.NO.	PART NO.	DESCRIPTION	REMARK

<TRANSISTOR>

Q501	8-729-112-61	TRANSISTOR 2SA1441-L
Q502	8-729-119-76	TRANSISTOR 2SA1175-HFE

<RESISTOR>

R501	1-249-423-11	CARBON	3.3K	5%	1/4W	
R502	1-249-421-11	CARBON	2.2K	5%	1/4W	
R503	1-249-405-11	CARBON	100	5%	1/4W	
R504	1-249-421-11	CARBON	2.2K	5%	1/4W	
R505	1-249-419-11	CARBON	1.5K	5%	1/4W	
R506	1-249-381-11	CARBON	1	5%	1/4W	
R507	1-247-704-11	CARBON	220	5%	1/4W	F
R508	1-249-417-11	CARBON	1K	5%	1/4W	
R509	1-249-451-11	CARBON	2.2	5%	1/4W	F

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*1-639-942-11 NA BOARD
****

*1-564-519-11	PLUG, CONNECTOR 4P
*4-398-771-01	CAP, LED

<CAPACITOR>

C601	1-124-477-11	ELECT	47MF	20%	16V

<DIODE>

D601	8-719-955-04	DIODE PY5504S-1
D602	8-719-920-66	DIODE SLR-54VC12

<IC>

IC601	8-741-148-33	IC SBX1483-59

<TRANSISTOR>

Q601	8-729-119-78	TRANSISTOR 2SC2785-HFE

<RESISTOR>

R601	1-249-405-11	CARBON	100	5%	1/4W
R602	1-249-409-11	CARBON	220	5%	1/4W
R603	1-249-405-11	CARBON	100	5%	1/4W
R604	1-249-433-11	CARBON	22K	5%	1/4W
R605	1-249-429-11	CARBON	10K	5%	1/4W

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*1-639-943-11 NB BOARD
****

*1-564-507-11	PLUG, CONNECTOR 4P

<CAPACITOR>

C701	1-124-477-11	ELECT	47MF	20%	16V

<IC>

IC701	8-741-139-80	IC BX-1398

****

L Y

REF.NO.	PART NO.	DESCRIPTION			REMARK
	*1-639-931-11	L BOARD *******			
	*1-564-517-11	PLUG, CONNECTOR 2P			
	*1-564-526-11	PLUG, CONNECTOR 11P			
		<CAPACITOR>			
C301	1-101-004-00	CERAMIC	0.01MF		50V
C304	1-124-907-11	ELECT	10MF	20%	50V
		<IC>			
IC301	8-759-233-33	IC TC74HC541AP			
IC302	8-759-044-95	IC MC14495P1			
IC303	8-759-044-95	IC MC14495P1			
IC304	8-719-901-68	DIODE GL-6R202			
		<COIL>			
L301	1-459-155-00	COIL (WITH CORE) 45UH			
		<TRANSISTOR>			
Q301	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q302	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q303	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q304	8-729-119-78	TRANSISTOR 2SC2785-HFE			
		<RESISTOR>			
R301	1-249-441-11	CARBON	100K	5%	1/4W
R302	1-249-441-11	CARBON	100K	5%	1/4W

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REF.NO.	PART NO.	DESCRIPTION			REMARK
	*A-1394-325-A	Y BOARD, COMPLETE *****************			
	1-526-654-00	SOCKET, IC (DP) 16P			
	*1-526-659-00	SOCKET, IC (DP) 28P			
	*1-526-950-11	SOCKET, IC 64P			
	*1-563-949-11	SOCKET, SIL 8P			
	*1-568-984-11	CONNECTOR, MALE 96P			
		<CAPACITOR>			
C2	1-124-927-11	ELECT	4.7MF	20%	50V
C3	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C4	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C5	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C6	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C7	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C8	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C9	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C10	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C11	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C12	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C13	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C14	1-163-036-00	CERAMIC CHIP	0.068MF		50V
C15	1-163-833-00	CERAMIC CHIP	0.068	10%	25V
C16	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C17	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C18	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C19	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C20	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C21	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C22	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C23	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C24	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C25	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C26	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C27	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C28	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C29	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C30	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C31	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C32	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C33	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C34	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C35	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C36	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C37	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C38	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C39	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C40	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C41	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C42	1-124-477-11	ELECT	47MF	20%	16V
C43	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C45	1-163-089-00	CERAMIC CHIP	6PF	0.5PF	50V
C46	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C47	1-124-119-00	ELECT	330MF	20%	16V
C48	1-124-477-11	ELECT	47MF	20%	16V
C49	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C50	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C51	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C52	1-126-103-11	ELECT	470MF	20%	16V
C53	1-126-101-11	ELECT	100MF	20%	16V
C54	1-126-101-11	ELECT	100MF	20%	16V
C55	1-126-101-11	ELECT	100MF	20%	16V
C56	1-126-101-11	ELECT	100MF	20%	16V
C57	1-613-227-11	CERAMIC CHIP	10PF	5%	50V
C58	1-613-227-11	CERAMIC CHIP	10PF	5%	50V
C59	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C60	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C61	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C62	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C63	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C64	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C65	1-163-036-00	CERAMIC CHIP	0.068MF		50V
C67	1-124-119-00	ELECT	330MF	20%	16V
C68	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C69	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C70	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C71	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C72	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C73	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C74	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C75	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C76	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C77	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C78	1-124-907-11	ELECT	10MF	20%	50V
C79	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C80	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C81	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C82	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C83	1-124-907-11	ELECT	10MF	20%	50V
C84	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C85	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION		REMARK
C86	1-163-133-00	CERAMIC CHIP 470PF	5%	50V
C87	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C88	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V
C90	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C91	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
C92	1-164-004-11	CERAMIC CHIP 0.1MF	10%	25V
		<DIODE>		
D1	8-719-971-20	DIODE ERC38-06		
D2	8-719-971-20	DIODE ERC38-06		
D4	8-719-800-60	DIODE TLR214		
D5	8-719-104-34	DIODE 1S2836		
D7	**8-719-400-18**	**DIODE MA152WK**		
D8	8-719-400-18	DIODE MA152WK		
D9	8-719-104-34	DIODE 1S2836		
		<IC>		
IC1	8-759-320-49	IC HD64180R1P8		
IC2	8-759-748-29	IC MBM27C512-20		
IC3	8-752-331-00	IC CXK5864BM-12L		
IC4	8-759-720-67	IC X28C64PI		
IC5	8-759-032-17	IC MC74HC14AF		
IC6	8-759-206-28	IC TC74HC123F		
IC7	8-759-008-21	IC MC74HC541F		
IC8	8-759-008-21	IC MC74HC541F		
IC9	8-759-995-97	IC MB8855-1314N		
IC10	8-759-984-56	IC MB670840PF		
IC11	8-759-984-59	IC MB654842UPF		
IC12	8-759-984-58	IC MB671469PF		
IC13	8-759-984-57	IC MB605195		
IC14	8-752-322-10	IC CXK5814P-45L		
IC15	8-752-333-84	IC CXK3864-040M		
IC16	8-752-333-85	IC CXK3864-041M		
IC17	8-752-333-86	IC CXK3864-042M		
IC18	8-759-301-24	IC HD10124		
IC19	8-759-301-24	IC HD10124		
IC20	8-752-306-51	IC CX23065A		
IC21	8-759-911-24	IC SN74S124N		
IC22	8-759-100-93	IC UPC393G2		
IC23	8-759-031-50	IC MC74F00M		
IC24	8-759-008-57	IC MC34051P		
IC25	8-759-114-06	IC UPC814G2-1		
IC26	8-759-032-01	IC MC74HC00AF		
IC27	8-759-925-98	IC SN74HC107ANS		
IC28	8-759-032-01	IC MC74HC00AF		
IC29	8-759-206-28	IC TC74HC123A		
IC30	8-759-032-29	IC MC74HC126AF		
IC31	8-759-032-17	IC MC74HC14AF		
IC32	8-759-008-21	IC MC74HC541F		
IC33	8-759-979-65	IC RH5VA43AA		
IC34	8-759-032-41	IC MC74HC157AF		
		<COIL>		
L1	1-459-155-00	COIL (WITH CORE) 45UH		
L2	1-459-155-00	COIL (WITH CORE) 45UH		
L3	1-459-155-00	COIL (WITH CORE) 45UH		
L4	1-459-155-00	COIL (WITH CORE) 45UH		
		<IC LINK>		
PS1	⚠ 1-532-679-91	LINK, IC (ICP-N15)		

REF.NO.	PART NO.	DESCRIPTION				REMARK
PS2	⚠ 1-532-679-91	LINK, IC (ICP-N15)				
		<TRANSISTOR>				
Q3	8-729-230-46	TRANSISTOR 2SA1162-YG				
Q4	8-729-230-46	TRANSISTOR 2SA1162-YG				
Q5	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q6	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q7	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q8	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q9	8-729-230-46	TRANSISTOR 2SA1162-YG				
		<RESISTOR>				
R1	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R2	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R3	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R4	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R5	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R6	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R7	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R8	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R9	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R10	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R11	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R12	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R13	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R14	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R15	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R16	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R17	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R18	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R19	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R20	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R21	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R22	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R23	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R24	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R25	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R26	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R27	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R28	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R29	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R30	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R31	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R32	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R33	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R34	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R36	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R37	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R38	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R39	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R40	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R41	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R42	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R43	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R44	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R45	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R46	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R47	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R48	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R49	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R50	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R51	1-216-037-00	METAL GLAZE	330	5%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R52	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R53	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R54	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R55	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R56	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R57	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R58	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R59	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R62	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R63	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R64	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R65	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R66	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R67	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R68	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R69	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R70	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R71	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R72	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R73	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R74	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R75	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R76	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R77	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R78	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R79	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R80	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R81	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R82	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R83	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R84	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R85	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R86	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R87	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R88	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R89	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R90	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R91	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R92	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R93	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R100	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R101	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R102	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R103	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R104	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R105	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R106	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R107	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R108	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R109	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R110	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R111	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R112	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R113	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R114	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R115	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R116	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R117	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R118	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R119	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R120	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R121	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R122	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R123	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R124	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R125	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R126	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R127	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R128	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R129	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R130	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R131	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R132	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R133	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R134	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R135	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R136	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R137	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R138	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R139	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R140	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R141	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R142	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R143	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R146	1-216-675-11	METAL CHIP	10K	0.50%	1/10W	
R147	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R148	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R149	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R150	1-216-105-00	METAL GLAZE	220K	5%	1/10W	
R151	1-216-113-00	METAL GLAZE	470K	5%	1/10W	
R152	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R153	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R154	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R155	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R156	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R157	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R158	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R159	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R160	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R162	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R163	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R164	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R165	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R166	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R167	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R168	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R169	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R170	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R171	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R172	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R173	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R174	1-216-079-00	METAL GLAZE	18K	5%	1/10W	
R175	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R176	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W	
R177	1-216-129-00	METAL GLAZE	2.2M	5%	1/10W	
R178	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R179	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R181	1-216-089-00	METAL GLAZE	47K	5%	1/10W	
R182	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R183	1-216-033-00	METAL GLAZE	220	5%	1/10W	
R184	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R185	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R187	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R189	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	

<SWITCH>

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION	REMARK
SW1	1-570-598-11	SWITCH, DIP	
SW2	1-570-204-21	SWITCH, KEY BOARD	

<CRYSTAL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
X1	1-578-687-11	VIBRATOR, CRYSTAL	
X2	1-577-116-21	VIBRATOR, CRYSTAL	
X3	1-567-192-11	OSCILLATOR, CERAMIC	
X4	1-577-353-11	VIBRATOR, CERAMIC	

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M1 BOARD (SOPS-1037)
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REF.NO.	PART NO.	DESCRIPTION	REMARK
	⚠ 1-543-060-00	CORE	
	⚠*2-643-841-01	SHEET, INSULATING	
	⚠*4-873-829-02	HEAT SINK	

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C108	⚠ 1-161-743-00	CERAMIC	0.0047MF		400V
C109	⚠ 1-125-593-11	ELECT(BLOCK)	2000MF	20%	250V
C110	⚠ 1-125-593-11	ELECT(BLOCK)	2000MF	20%	250V
C111	⚠ 1-125-593-11	ELECT(BLOCK)	2000MF	20%	250V
C112	⚠ 1-125-593-11	ELECT(BLOCK)	2000MF	20%	250V
C114	⚠ 1-136-626-11	FILM	1MF	10%	250V
C115	⚠ 1-136-626-11	FILM	1MF	10%	250V
C116	⚠ 1-136-626-11	FILM	1MF	10%	250V
C117	⚠ 1-136-626-11	FILM	1MF	10%	250V
C118	⚠ 1-161-915-00	CERAMIC	0.001MF	10%	500V
C119	⚠ 1-161-915-00	CERAMIC	0.001MF	10%	500V
C120	⚠ 1-136-202-11	FILM	0.33MF	5%	400V
C121	⚠ 1-136-202-11	FILM	0.33MF	5%	400V
C122	⚠ 1-161-742-00	CERAMIC	0.0022MF	20%	400V
C124	⚠ 1-161-743-11	CERAMIC	0.0047MF		400V
C125	⚠ 1-161-743-11	CERAMIC	0.0047MF		400V
C126	⚠ 1-161-743-11	CERAMIC	0.0047MF		400V
C201	⚠ 1-102-030-00	CERAMIC	330PF	10%	500V
C202	⚠ 1-102-030-00	CERAMIC	330PF	10%	500V
C203	⚠ 1-102-030-00	CERAMIC	330PF	10%	500V
C204	⚠ 1-102-030-00	CERAMIC	330PF	10%	500V
C205	⚠ 1-162-558-11	CERAMIC	100PF	10%	2KV
C206	⚠ 1-162-558-11	CERAMIC	100PF	10%	2KV
C207	⚠ 1-162-558-11	CERAMIC	100PF	10%	2KV
C208	⚠ 1-162-558-11	CERAMIC	100PF	10%	2KV
C209	⚠ 1-162-131-11	CERAMIC	220PF	10%	2KV
C210	⚠ 1-162-131-11	CERAMIC	220PF	10%	2KV
C211	⚠ 1-162-131-11	CERAMIC	220PF	10%	2KV
C212	⚠ 1-162-131-11	CERAMIC	220PF	10%	2KV
C213	⚠ 1-126-911-11	ELECT	47MF	0	200V
C214	⚠ 1-126-911-11	ELECT	47MF	0	200V
C215	⚠ 1-126-913-11	ELECT	220MF	0	160V
C216	⚠ 1-126-913-11	ELECT	220MF	0	160V
C217	⚠ 1-126-912-11	ELECT	33MF	0	250V
C218	⚠ 1-126-913-11	ELECT	220MF	0	160V
C219	⚠ 1-130-483-00	MYLAR	0.01MF	5%	50V
C221	⚠ 1-130-493-00	MYLAR	0.068MF	5%	50V
C222	⚠ 1-130-485-00	MYLAR	0.015MF	5%	50V
C223	⚠ 1-130-485-00	MYLAR	0.015MF	5%	50V
C224	⚠ 1-126-911-11	ELECT	47MF	0	200V
C225	⚠ 1-124-907-11	ELECT	10MF	20%	50V
C226	⚠ 1-124-478-11	ELECT	100MF	20%	25V
C227	⚠ 1-124-443-00	ELECT	100MF	20%	10V
C228	⚠ 1-130-495-00	MYLAR	0.1MF	5%	50V
C229	⚠ 1-130-495-00	MYLAR	0.1MF	5%	50V
C230	⚠ 1-124-902-00	ELECT	0.47MF	20%	50V
C231	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C232	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
CN103	⚠*1-535-419-00	TAB, FASTEN (PCB)	
CN104	⚠*1-535-419-00	TAB, FASTEN (PCB)	
CN106	⚠*1-560-549-00	PIN (WITH V CONNECTOR BASE) 3P	
CN107	⚠*1-535-419-00	TAB, FASTEN (PCB)	
CN108	⚠*1-535-419-00	TAB, FASTEN (PCB)	
CN109	⚠*1-535-419-00	TAB, FASTEN (PCB)	
CN110	⚠*1-535-419-00	TAB, FASTEN (PCB)	
CN111	⚠*1-535-419-00	TAB, FASTEN (PCB)	
CN202	⚠*1-560-894-00	PIN, CONNECTOR 6P	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D101	⚠ 8-719-500-27	DIODE S15VB60	
D102	⚠ 8-719-210-21	DIODE 11EQS04	
D103	⚠ 8-719-210-21	DIODE 11EQS04	
D201	⚠ 8-719-971-20	DIODE ERC38-06	
D202	⚠ 8-719-971-20	DIODE ERC38-06	
D203	⚠ 8-719-971-20	DIODE ERC38-06	
D204	⚠ 8-719-971-20	DIODE ERC38-06	
D205	⚠ 8-719-979-28	DIODE ESAD39-06C	
D206	⚠ 8-719-979-29	DIODE ESAD39-06N	
D207	⚠ 8-719-911-55	DIODE U05G	
D208	⚠ 8-719-911-55	DIODE U05G	
D209	⚠ 8-719-109-89	DIODE RD5.6ES-B2	
D210	⚠ 8-719-911-19	DIODE 1SS119	
D211	⚠ 8-719-911-19	DIODE 1SS119	
D213	⚠ 8-719-110-88	DIODE RD39ES-B2	
D214	⚠ 8-719-110-88	DIODE RD39ES-B2	
D215	⚠ 8-719-911-19	DIODE 1SS119	
D216	⚠ 8-719-911-19	DIODE 1SS119	
D218	⚠ 8-719-912-20	DIODE 1SS120	
D219	⚠ 8-719-912-20	DIODE 1SS120	
D220	⚠ 8-719-911-19	DIODE 1SS119	

<FUSE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
F103	⚠ 1-532-496-11	FUSE, THERMO (10A/250V)	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC201	⚠ 8-759-135-80	IC UPC358C	
IC202	⚠ 8-759-908-15	IC TL431CLP	
IC203	⚠ 8-759-135-80	IC UPC358C	
IC204	⚠ 8-759-908-15	IC TL431CLP	

<COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
L104	⚠ 1-424-058-11	LFT	
L201	⚠ 1-412-263-11	COIL,CHOKE(CCLU160708Z) 22MMH	
L202	⚠ 1-412-264-11	COIL,CHOKE(CCLU270817Z)1.36MMH	
L203	⚠ 1-408-949-11	COIL (WITH CORE) (CHOKE COIL)	
L204	⚠ 1-421-370-00	COIL, CHOKE	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q101	⚠ 1-808-107-11	TRANSISTOR 2SK827	
Q102	⚠ 1-808-107-11	TRANSISTOR 2SK827	

• ※ Selected to yield optimum performance.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION				REMARK
Q103	⚠ 1-808-107-11	TRANSISTOR 2SK827				
Q104	⚠ 1-808-107-11	TRANSISTOR 2SK827				
Q105	⚠ 8-729-140-93	TRANSISTOR 2SB733-4				
Q106	⚠ 8-729-140-93	TRANSISTOR 2SB733-4				
Q201	⚠ 8-729-821-53	TRANSISTOR 2SC3042-N				
Q202	⚠ 8-729-105-97	TRANSISTOR 2SK1156-2K				
Q203	⚠ 8-729-175-22	TRANSISTOR 2SC2752-L				
Q204	⚠ 8-729-173-38	TRANSISTOR 2SA733-K				
Q205	⚠ 8-729-173-38	TRANSISTOR 2SA733-K				
Q206	⚠ 8-729-173-38	TRANSISTOR 2SA733-K				
Q207	⚠ 8-729-173-38	TRANSISTOR 2SA733-K				
Q208	⚠ 8-729-208-04	TRANSISTOR 2SK422				
Q209	⚠ 8-729-208-04	TRANSISTOR 2SK422				

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R102	⚠ 1-205-916-11	WIREWOUND	5	5%	20W	F
R103	⚠ 1-205-916-11	WIREWOUND	5	5%	20W	F
R104	⚠ 1-205-624-00	WIREWOUND	100	5%	5W	F
R105	⚠ 1-247-696-11	CARBON	47	5%	1/4W	F
R106	⚠ 1-247-696-11	CARBON	47	5%	1/4W	F
R107	⚠ 1-247-696-11	CARBON	47	5%	1/4W	F
R108	⚠ 1-247-696-11	CARBON	47	5%	1/4W	F
R109	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W	
R110	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W	
R111	⚠ 1-205-624-00	WIREWOUND	100	5%	5W	F
R201	⚠ 1-205-677-00	WIREWOUND	1K	5%	5W	F
R202	⚠ 1-205-677-00	WIREWOUND	1K	5%	5W	F
R203	⚠ 1-249-429-11	CARBON	10K	5%	1/4W	
R204	⚠ 1-249-441-11	CARBON	100K	5%	1/4W	
R205	⚠ 1-249-441-11	CARBON	100K	5%	1/4W	
R206	⚠ 1-249-405-11	CARBON	100	5%	1/4W	
R207	⚠ 1-249-417-11	CARBON	1K	5%	1/4W	
R208	⚠ 1-215-477-00	METAL	220K	1%	1/4W	
R209	⚠ 1-215-477-00	METAL	220K	1%	1/4W	
R210	⚠ 1-215-445-00	METAL	10K	1%	1/4W	
R212	⚠ 1-205-676-11	WIREWOUND	4.7	5%	5W	F
R213	⚠ 1-215-477-00	METAL	220K	1%	1/4W	
R214	⚠ 1-215-477-00	METAL	220K	1%	1/4W	
R215	⚠ 1-215-445-00	METAL	10K	1%	1/4W	
R216	⚠ 1-249-424-11	CARBON	3.9K	5%	1/4W	
R217	⚠ 1-247-887-00	CARBON	220K	5%	1/4W	
R218	⚠ 1-247-887-00	CARBON	220K	5%	1/4W	
R219	⚠ 1-247-895-00	CARBON	470K	5%	1/4W	
R220	⚠ 1-247-903-00	CARBON	1M	5%	1/4W	
R221	⚠ 1-249-419-11	CARBON	1.5K	5%	1/4W	
R222	⚠ 1-249-417-11	CARBON	1K	5%	1/4W	
R223	⚠ 1-249-426-11	CARBON	5.6K	5%	1/4W	
R224	⚠ 1-249-425-11	CARBON	4.7K	5%	1/4W	
R226	⚠ 1-247-747-11	CARBON	470	5%	1/2W	F
R227	⚠ 1-247-747-11	CARBON	470	5%	1/2W	F
R228	⚠ 1-215-431-00	METAL	2.7K	1%	1/4W	
※R229	⚠ 1-215-456-00	METAL	30K	1%	1/4W	
※R229	⚠ 1-215-457-00	METAL	33K	1%	1/4W	
※R229	⚠ 1-215-458-00	METAL	36K	1%	1/4W	
※R229	⚠ 1-215-459-00	METAL	39K	1%	1/4W	
※R229	⚠ 1-215-460-00	METAL	43K	1%	1/4W	
※R229	⚠ 1-215-461-00	METAL	47K	1%	1/4W	
※R229	⚠ 1-215-462-00	METAL	51K	1%	1/4W	
※R229	⚠ 1-215-463-00	METAL	56K	1%	1/4W	
※R229	⚠ 1-215-464-00	METAL	62K	1%	1/4W	
R230	⚠ 1-249-426-11	CARBON	5.6K	5%	1/4W	
R231	⚠ 1-249-426-11	CARBON	5.6K	5%	1/4W	
R232	⚠ 1-215-473-00	METAL	150K	1%	1/4W	
R233	⚠ 1-215-441-00	METAL	6.8K	1%	1/4W	
R234	⚠ 1-215-469-00	METAL	100K	1%	1/4W	
R235	⚠ 1-215-469-00	METAL	100K	1%	1/4W	
R236	⚠ 1-215-436-00	METAL	4.3K	1%	1/4W	
R237	⚠ 1-215-902-11	METAL OXIDE	47K	5%	2W	F
R238	⚠ 1-215-902-11	METAL OXIDE	47K	5%	2W	F
R239	⚠ 1-205-677-00	WIREWOUND	1K	5%	5W	F
R240	⚠ 1-205-677-00	WIREWOUND	1K	5%	5W	F
R241	⚠ 1-249-432-11	CARBON	18K	5%	1/4W	
R242	⚠ 1-249-426-11	CARBON	5.6K	5%	1/4W	
R243	⚠ 1-249-431-11	CARBON	15K	5%	1/4W	
R244	⚠ 1-249-413-11	CARBON	470	5%	1/4W	
R245	⚠ 1-249-431-11	CARBON	15K	5%	1/4W	
R246	⚠ 1-247-893-11	CARBON	390K	5%	1/4W	
R247	⚠ 1-215-465-00	METAL	68K	1%	1/4W	
R248	⚠ 1-215-433-00	METAL	3.3K	1%	1/4W	
R249	⚠ 1-215-465-00	METAL	68K	1%	1/4W	
R250	⚠ 1-215-465-00	METAL	68K	1%	1/4W	
R251	⚠ 1-215-433-00	METAL	3.3K	1%	1/4W	
R252	⚠ 1-215-447-00	METAL	12K	1%	1/4W	
R253	⚠ 1-215-447-00	METAL	12K	1%	1/4W	
R254	⚠ 1-215-413-00	METAL	470	1%	1/4W	
R255	⚠ 1-216-377-11	METAL OXIDE	4.7	5%	2W	F

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
RV201	⚠ 1-228-990-00	RES, ADJ, METAL GLAZE 1K	
RV202	⚠ 1-228-990-00	RES, ADJ, METAL GLAZE 1K	

<RELAY>

REF.NO.	PART NO.	DESCRIPTION	REMARK
RY101	⚠ 1-515-450-00	RELAY, POWER	

<TRANSFORMER>

REF.NO.	PART NO.	DESCRIPTION	REMARK
T101	⚠ 1-449-845-11	TRANSFORMER, CONVERTER	
T102	⚠ 1-421-819-11	TRANSFORMER, CURRENT	
T103	⚠ 1-437-188-11	TRANSFORMER, DRIVE	
T104	⚠ 1-437-188-11	TRANSFORMER, DRIVE	

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C1 BOARD (SOPS-1037)

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<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C51	⚠ 1-130-471-00	MYLAR	0.001MF	5%	50V	
C52	⚠ 1-130-471-00	MYLAR	0.001MF	5%	50V	
C53	⚠ 1-124-902-00	ELECT	0.47MF	20%	50V	
C54	⚠ 1-124-478-11	ELECT	100MF	20%	25V	
C56	⚠ 1-130-483-00	MYLAR	0.01MF	5%	50V	
C57	⚠ 1-130-495-00	MYLAR	0.1MF	5%	50V	
C58	⚠ 1-124-910-11	ELECT	47MF	20%	50V	
C59	⚠ 1-124-902-00	ELECT	0.47MF	20%	50V	

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
CN51	⚠*1-560-741-00	PIN, CONNECTOR 12P	
CN52	⚠*1-564-517-11	PLUG, CONNECTOR 2P	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D51	⚠ 8-719-210-21	DIODE 11EQS04	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION			REMARK
D52	⚠ 8-719-210-21	DIODE 11EQS04			
D53	⚠ 8-719-210-21	DIODE 11EQS04			
D54	⚠ 8-719-210-21	DIODE 11EQS04			
D55	⚠ 8-719-210-21	DIODE 11EQS04			
D56	⚠ 8-719-210-21	DIODE 11EQS04			
D57	⚠ 8-719-911-19	DIODE 1SS119			
D58	⚠ 8-719-107-87	THYRISTOR 03P2M			
D59	⚠ 8-719-911-19	DIODE 1SS119			

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC51	⚠ 8-759-906-62	IC MB3759P-SNY

<COIL>

REF.NO.	PART NO.	DESCRIPTION	
L51	⚠ 1-410-466-41	INDUCTOR	4.7UH

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q53	⚠ 8-729-173-38	TRANSISTOR 2SA733-K

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION			
R51	⚠ 1-249-410-11	CARBON	270	5%	1/4W
R52	⚠ 1-249-417-11	CARBON	1K	5%	1/4W
R53	⚠ 1-249-417-11	CARBON	1K	5%	1/4W
R54	⚠ 1-249-417-11	CARBON	1K	5%	1/4W
R56	⚠ 1-249-433-11	CARBON	22K	5%	1/4W
R57	⚠ 1-247-897-11	CARBON	560K	5%	1/4W
R58	⚠ 1-249-437-11	CARBON	47K	5%	1/4W
R59	⚠ 1-249-405-11	CARBON	100	5%	1/4W
R60	⚠ 1-247-885-00	CARBON	180K	5%	1/4W
R61	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W
R62	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W
R63	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W
R64	⚠ 1-247-895-00	CARBON	470K	5%	1/4W
R65	⚠ 1-249-425-11	CARBON	4.7K	5%	1/4W
R66	⚠ 1-249-426-11	CARBON	5.6K	5%	1/4W
R67	⚠ 1-249-425-11	CARBON	4.7K	5%	1/4W
R68	⚠ 1-249-415-11	CARBON	680	5%	1/4W
R69	⚠ 1-249-405-11	CARBON	100	5%	1/4W
R70	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W
R71	⚠ 1-215-469-00	METAL	100K	1%	1/4W

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M2 BOARD (SOPS-1037)

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REF.NO.	PART NO.	DESCRIPTION
	⚠ 1-543-060-00	CORE

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION			REMARK
C151	⚠ 1-125-592-11	ELECT (BLOCK)	270MF	20%	400V
C152	⚠ 1-136-626-11	FILM	1MF	10%	250V
C153	⚠ 1-136-626-11	FILM	1MF	10%	250V
C154	⚠ 1-161-915-00	CERAMIC	0.001MF	10%	500V
C155	⚠ 1-161-915-00	CERAMIC	0.001MF	10%	500V
C156	⚠ 1-136-209-11	FILM	0.1MF	10%	400V
C157	⚠ 1-130-491-00	MYLAR	0.047MF	5%	50V
C158	⚠ 1-130-475-00	MYLAR	0.0022MF	5%	50V
C165	⚠ 1-126-233-11	ELECT	22MF	20%	25V
C166	⚠ 1-136-626-11	FILM	1MF	10%	250V
C167	⚠ 1-136-626-11	FILM	1MF	10%	250V
C168	⚠ 1-136-202-11	FILM	0.33MF	5%	400V
C169	⚠ 1-136-202-11	FILM	0.33MF	5%	400V
C170	⚠ 1-161-742-00	CERAMIC	0.0022MF	20%	400V
C251	⚠ 1-162-659-11	CERAMIC	0.0015MF	10%	500V
C252	⚠ 1-162-659-11	CERAMIC	0.0015MF	10%	500V
C253	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C254	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C255	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C256	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C257	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C258	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C259	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C260	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C261	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C262	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C263	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C264	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C265	⚠ 1-124-473-11	ELECT	1000MF	20%	10V
C266	⚠ 1-124-473-11	ELECT	1000MF	20%	10V
C267	⚠ 1-124-636-00	ELECT	3300MF	20%	25V
C268	⚠ 1-124-636-00	ELECT	3300MF	20%	25V
C269	⚠ 1-124-913-11	ELECT	470MF	20%	50V
C270	⚠ 1-124-913-11	ELECT	470MF	20%	50V
C271	⚠ 1-124-472-11	ELECT	470MF	20%	6.3V
C272	⚠ 1-124-472-11	ELECT	470MF	20%	6.3V
C273	⚠ 1-124-480-11	ELECT	470MF	20%	25V
C274	⚠ 1-124-480-11	ELECT	470MF	20%	25V
C275	⚠ 1-124-122-11	ELECT	100MF	20%	50V
C276	⚠ 1-124-122-11	ELECT	100MF	20%	50V
C278	⚠ 1-130-489-00	MYLAR	0.033MF	5%	50V
C279	⚠ 1-130-485-00	MYLAR	0.015MF	5%	50V
C280	⚠ 1-130-485-00	MYLAR	0.015MF	5%	50V
C281	⚠ 1-130-495-00	MYLAR	0.1MF	5%	50V
C282	⚠ 1-130-495-00	MYLAR	0.1MF	5%	50V
C283	⚠ 1-124-442-00	ELECT	330MF	20%	6.3V
C284	⚠ 1-124-556-11	ELECT	2200MF	20%	16V
C285	⚠ 1-124-478-11	ELECT	100MF	20%	25V
C286	⚠ 1-124-360-00	ELECT	1000MF	20%	16V
C287	⚠ 1-124-907-11	ELECT	10MF	20%	50V
C288	⚠ 1-126-103-11	ELECT	470MF	20%	16V
C289	⚠ 1-124-902-00	ELECT	0.47MF	20%	50V
C290	⚠ 1-124-478-11	ELECT	100MF	20%	25V
C291	⚠ 1-130-495-00	MYLAR	0.1MF	5%	50V
C292	⚠ 1-130-495-00	MYLAR	0.1MF	5%	50V
C293	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C294	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C295	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C296	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C297	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V
C298	⚠ 1-161-925-00	CERAMIC	100PF	10%	500V

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION
CN151	⚠*1-560-549-00	PIN (WITH V CONNECTOR BASE) 3P
CN252	⚠*1-560-894-00	PIN, CONNECTOR 6P
CN254	⚠*1-560-891-00	PIN, CONNECTOR 3P
CN255	⚠*1-560-891-00	PIN, CONNECTOR 3P

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D151	⚠ 8-719-210-21	DIODE 11EQS04
D152	⚠ 8-719-210-21	DIODE 11EQS04
D153	⚠ 8-719-300-70	DIODE RH-1C
D154	⚠ 8-719-912-20	DIODE 1SS120
D155	⚠ 8-719-912-20	DIODE 1SS120

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION	REMARK
D156	⚠ 8-719-109-89	DIODE RD5.6ES-B2	
D158	⚠ 8-719-912-20	DIODE 1SS120	
D159	⚠ 8-719-912-20	DIODE 1SS120	
D251	⚠ 8-719-302-81	DIODE FMG-24S	
D252	⚠ 8-719-313-14	DIODE FML-22S	
D253	⚠ 8-719-302-60	DIODE FML-32S	
D254	⚠ 1-807-793-21	DIODE FML-22R	
D255	⚠ 1-807-793-21	DIODE FML-22R	
D256	⚠ 8-719-302-82	DIODE FMG-24R	
D265	⚠ 8-719-110-88	DIODE RD39ES-B2	
D266	⚠ 8-719-110-88	DIODE RD39ES-B2	
D267	⚠ 8-719-200-02	DIODE 11E2FA-9	
D268	⚠ 8-719-200-02	DIODE 11E2FA-9	
D270	⚠ 8-719-911-19	DIODE 1SS119	
D271	⚠ 8-719-911-19	DIODE 1SS119	
D272	⚠ 8-719-911-19	DIODE 1SS119	
D273	⚠ 8-719-911-19	DIODE 1SS119	
D274	⚠ 8-719-911-19	DIODE 1SS119	
D275	⚠ 8-719-911-19	DIODE 1SS119	
D276	⚠ 8-719-109-89	DIODE RD5.6ES-B2	
D277	⚠ 8-719-110-41	DIODE RD15ES-B2	
D278	⚠ 8-719-110-48	DIODE RD18ES-B1	
D279	⚠ 8-719-109-97	DIODE RD6.8ES-B2	
D280	⚠ 8-719-110-33	DIODE RD12ES-B3	
D281	⚠ 8-719-313-16	DIODE AU02A	
D282	⚠ 8-719-210-21	DIODE 11EQS04	
D283	⚠ 8-719-109-84	DIODE RD5.1ES-B1	
D284	⚠ 8-719-109-97	DIODE RD6.8ES-B2	
D285	⚠ 8-719-911-19	DIODE 1SS119	
D286	⚠ 8-719-911-19	DIODE 1SS119	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC251	⚠ 8-759-908-15	IC TL431CLP	
IC252	⚠ 8-759-135-80	IC UPC358C	
IC253	⚠ 8-759-143-00	IC UPC7805HF	

<COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
L151	⚠ 1-424-058-11	LFT	
L251	⚠ 1-412-266-11	COIL, CHOKE (CCL U230914Z) 136UH	
L252	⚠ 1-412-266-11	COIL, CHOKE (CCL U230914Z) 136UH	
L253	⚠ 1-412-265-11	COIL, CHOKE (CCLU230914Z) 2.25MMH	
L254	⚠ 1-421-465-00	COIL, FERRITE CHOKE 68UH	
L255	⚠ 1-421-370-00	COIL, CHOKE	
L256	⚠ 1-421-370-00	COIL, CHOKE	
L257	⚠ 1-421-370-00	COIL, CHOKE	
L258	⚠ 1-421-370-00	COIL, CHOKE	
L259	⚠ 1-421-465-00	COIL, FERRITE CHOKE 68UH	

<IC LINK>

REF.NO.	PART NO.	DESCRIPTION	REMARK
PS151	⚠ 1-532-605-11	LINK, IC	
PS251	⚠ 1-532-679-11	LINK, IC	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q151	⚠ 1-808-107-11	TRANSISTOR 2SK827	
	⚠ 9-983-709-01	RUBBER (STB-CR07), RADIATION; Q151	
Q152	⚠ 1-808-107-11	TRANSISTOR 2SK827	
	⚠ 9-983-709-01	RUBBER (STB-CR07), RADIATION; Q152	
Q153	⚠ 8-729-140-93	TRANSISTOR 2SB733-4	
Q154	⚠ 8-729-140-93	TRANSISTOR 2SB733-4	
Q155	⚠ 8-729-802-08	TRANSISTOR 2SC3150	
Q156	⚠ 8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q251	⚠ 8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q252	⚠ 8-729-188-23	TRANSISTOR 2SD882-Q	
	⚠ 9-983-709-01	RUBBER (STB-CR07), RADIATION; Q252	
Q253	⚠ 8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q254	⚠ 8-729-140-97	TRANSISTOR 2SB734-34	
Q255	⚠ 8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q256	⚠ 8-729-208-04	TRANSISTOR 2SK422	
Q257	⚠ 8-729-208-04	TRANSISTOR 2SK422	
Q258	⚠ 8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q259	⚠ 8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q260	⚠ 8-729-119-78	TRANSISTOR 2SC2785-HFE	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R151	⚠ 1-205-652-00	WIREWOUND	68	5%	5W	F
R152	⚠ 1-247-696-11	CARBON	47	5%	1/4W	F
R153	⚠ 1-247-696-11	CARBON	47	5%	1/4W	F
R154	⚠ 1-247-717-11	CARBON	2.2K	5%	1/4W	
R155	⚠ 1-247-717-11	CARBON	2.2K	5%	1/4W	
R156	⚠ 1-215-902-11	METAL OXIDE	47K	5%	2W	F
R157	⚠ 1-215-902-11	METAL OXIDE	47K	5%	2W	F
R158	⚠ 1-246-539-00	CARBON	560K	5%	1/4W	
R159	⚠ 1-246-539-00	CARBON	560K	5%	1/4W	
R160	⚠ 1-247-733-11	CARBON	33	5%	1/2W	
R161	⚠ 1-247-713-11	CARBON	1K	5%	1/4W	
R162	⚠ 1-249-407-11	CARBON	150	5%	1/4W	
R163	⚠ 1-249-390-11	CARBON	5.6	5%	1/4W	
R164	⚠ 1-249-405-11	CARBON	100	5%	1/4W	
R165	⚠ 1-247-741-11	CARBON	150	5%	1/2W	F
R166	⚠ 1-249-393-11	CARBON	10	5%	1/4W	
R251	⚠ 1-205-622-00	WIREWOUND	33	5%	5W	F
R252	⚠ 1-205-622-00	WIREWOUND	33	5%	5W	F
R253	⚠ 1-216-359-00	METAL OXIDE	6.8	5%	1W	F
R254	⚠ 1-247-747-11	CARBON	470	5%	1/2W	
R255	⚠ 1-247-747-11	CARBON	470	5%	1/2W	
R256	⚠ 1-249-434-11	CARBON	27K	5%	1/4W	
R258	⚠ 1-249-437-11	CARBON	47K	5%	1/4W	
R259	⚠ 1-249-435-11	CARBON	33K	5%	1/4W	
R260	⚠ 1-249-417-11	CARBON	1K	5%	1/4W	
R261	⚠ 1-215-424-00	METAL	1.3K	1%	1/4W	
R262	⚠ 1-249-417-11	CARBON	1K	5%	1/4W	
R263	⚠ 1-215-452-00	METAL	20K	1%	1/4W	
R264	⚠ 1-249-417-11	CARBON	1K	5%	1/4W	
R265	⚠ 1-215-448-00	METAL	13K	1%	1/4W	
R266	⚠ 1-215-420-00	METAL	910	1%	1/4W	
R267	⚠ 1-205-911-11	WIREWOUND	10	5%	5W	F
R268	⚠ 1-247-711-11	CARBON	680	5%	1/4W	
R269	⚠ 1-247-700-11	CARBON	100	5%	1/4W	
R270	⚠ 1-215-430-00	METAL	2.4K	1%	1/4W	
R271	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W	
R272	⚠ 1-249-397-11	CARBON	22	5%	1/4W	
R273	⚠ 1-249-419-11	CARBON	1.5K	5%	1/4W	
R274	⚠ 1-249-432-11	CARBON	18K	5%	1/4W	
R275	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W	
R276	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W	
R277	⚠ 1-249-421-11	CARBON	2.2K	5%	1/4W	
R278	⚠ 1-249-429-11	CARBON	10K	5%	1/4W	
R279	⚠ 1-249-429-11	CARBON	10K	5%	1/4W	
R280	⚠ 1-249-417-11	CARBON	1K	5%	1/4W	
R281	⚠ 1-249-429-11	CARBON	10K	5%	1/4W	
R282	⚠ 1-249-429-11	CARBON	10K	5%	1/4W	
R283	⚠ 1-249-431-11	CARBON	15K	5%	1/4W	
R284	⚠ 1-249-429-11	CARBON	10K	5%	1/4W	
R285	⚠ 1-249-417-11	CARBON	1K	5%	1/4W	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION	REMARK
R286	⚠ 1-249-429-11	CARBON 10K 5% 1/4W	
R287	⚠ 1-249-429-11	CARBON 10K 5% 1/4W	
R288	⚠ 1-249-431-11	CARBON 15K 5% 1/4W	
R289	⚠ 1-249-429-11	CARBON 10K 5% 1/4W	

<VARIABLE RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
RV251	⚠ 1-228-990-00	RES, ADJ, METAL GLAZE 1K	

<TRANSFORMER>

REF.NO.	PART NO.	DESCRIPTION	REMARK
T151	⚠ 1-449-846-11	TRANSFORMER, CONVERTER	
T152	⚠ 1-421-819-11	TRANSFORMER, CURRENT	
T153	⚠ 1-437-188-11	TRANSFORMER, DRIVE	
T154	⚠ 1-437-188-11	TRANSFORMER, DRIVE	
T155	⚠ 1-449-847-11	TRANSFORMER, CONVERTER	

****

C2 BOARD (SOPS-1037)
****

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
C51	⚠ 1-130-471-00	MYLAR 0.001MF 5% 50V	
C52	⚠ 1-130-471-00	MYLAR 0.001MF 5% 50V	
C53	⚠ 1-124-902-00	ELECT 0.47MF 20% 50V	
C54	⚠ 1-124-478-11	ELECT 100MF 20% 25V	
C55	⚠ 1-130-471-00	FILM 0.001MF 5% 50V	
C56	⚠ 1-130-481-00	MYLAR 0.0068MF 5% 50V	
C57	⚠ 1-130-495-00	MYLAR 0.1MF 5% 50V	
C58	⚠ 1-124-907-11	ELECT 10MF 20% 50V	
C59	⚠ 1-124-907-11	ELECT 10MF 20% 50V	

<CONNECTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
CN51	⚠*1-560-741-00	PIN, CONNECTOR 12P	
CN52	⚠*1-564-517-11	PLUG, CONNECTOR 2P	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D51	⚠ 8-719-911-19	DIODE 1SS119	
D52	⚠ 8-719-911-19	DIODE 1SS119	
D53	⚠ 8-719-911-19	DIODE 1SS119	
D54	⚠ 8-719-911-19	DIODE 1SS119	
D55	⚠ 8-719-210-21	DIODE 11EQS04	
D56	⚠ 8-719-210-21	DIODE 11EQS04	
D57	⚠ 8-719-911-19	DIODE 1SS119	
D58	⚠ 8-719-107-87	THYRISTOR 03P2M	
D59	⚠ 8-719-911-19	DIODE 1SS119	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC51	⚠ 8-759-906-62	IC MB3759P-SNY	

<COIL>

REF.NO.	PART NO.	DESCRIPTION	REMARK
L51	⚠ 1-410-466-41	INDUCTOR 4.7UH	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q53	⚠ 8-729-173-38	TRANSISTOR 2SA733-K	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
R51	⚠ 1-249-411-11	CARBON 330 5% 1/4W	
R52	⚠ 1-249-410-11	CARBON 270 5% 1/4W	
R53	⚠ 1-249-417-11	CARBON 1K 5% 1/4W	
R54	⚠ 1-249-417-11	CARBON 1K 5% 1/4W	
R55	⚠ 1-215-437-00	METAL 4.7K 1% 1/4W	
R56	⚠ 1-247-903-00	CARBON 1M 5% 1/4W	
R57	⚠ 1-247-897-11	CARBON 560K 5% 1/4W	
R58	⚠ 1-249-433-11	CARBON 22K 5% 1/4W	
R59	⚠ 1-249-417-11	CARBON 1K 5% 1/4W	
R60	⚠ 1-249-425-11	CARBON 4.7K 5% 1/4W	
R61	⚠ 1-249-421-11	CARBON 2.2K 5% 1/4W	
R62	⚠ 1-249-425-11	CARBON 4.7K 5% 1/4W	
R63	⚠ 1-249-425-11	CARBON 4.7K 5% 1/4W	
R64	⚠ 1-247-895-00	CARBON 470K 5% 1/4W	
R65	⚠ 1-249-425-11	CARBON 4.7K 5% 1/4W	
R66	⚠ 1-249-423-11	CARBON 3.3K 5% 1/4W	
R67	⚠ 1-249-426-11	CARBON 5.6K 5% 1/4W	
R68	⚠ 1-249-415-11	CARBON 680 5% 1/4W	
R69	⚠ 1-249-405-11	CARBON 100 5% 1/4W	
R70	⚠ 1-249-421-11	CARBON 2.2K 5% 1/4W	
R71	⚠ 1-249-427-11	CARBON 6.8K 5% 1/4W	

****

MISCELLANEOUS
****

REF.NO.	PART NO.	DESCRIPTION	REMARK
	⚠. 1-236-604-12	FILTER BLOCK, NOISE (M3B BOARD)	
	⚠. 1-238-755-11	RESISTOR ASS'Y, HIGH-VOLTAGE	
	⚠. 1-413-700-11	SWITCHING REGULATOR (SOPS-1037)	
	⚠. 1-451-355-12	DEFLECTION YOKE (Y636PJ)	
	⚠. 1-452-429-21	NECK ASS'Y, PICTURE TUBE (NA366)	
	⚠. 1-452-487-31	NECK ASS'Y, PICTURE TUBE (NA363A)	
	⚠. 1-453-108-11	DC BLOCK, HIGH-VOLTAGE	
	⚠. 1-453-108-31	DC BLOCK, HIGH-VOLTAGE	
	1-466-674-11	INTERFACE UNIT (IFB-11)	
	1-503-255-00	SPEAKER	
	1-533-224-11	HOLDER, FUSE (DIA. 5.2)	
	1-541-923-31	FAN, DC	
	1-541-950-11	FAN, DC	
	*1-555-110-00	CABLE, P-P	
	⚠ 1-559-865-31	LEAD ASS'Y, HIGH-VOLTAGE	
	*1-575-091-11	CABLE, P-P	
	1-575-092-11	CONNECTOR ASS'Y, MULTI 14P	
	⚠. 1-580-375-11	INLET 3P	
	1-941-648-22	CONNECTOR ASS'Y MICRO 2P	
	⚠ 1-944-506-12	HARNESS (P)	
C901	⚠. 1-136-951-11	CAP, METALIZED FILM 0.1MF 20% 250V	
C902	⚠. 1-136-951-11	CAP, METALIZED FILM 0.1MF 20% 250V	
C903	⚠. 1-136-951-11	CAP, METALIZED FILM 0.1MF 20% 250V	
R901	⚠ 1-202-719-00	RES, SOLID 1.00MM 10% 1/2W	
F901	⚠. 1-532-325-11	FUSE, TIME-LAG (6.3A/250V)	
S901	⚠. 1-572-067-21	SWITCH, PUSH (1 KEY)(AC POWER)	
V901	⚠. 8-736-223-05	PICTURE TUBE 07MP R	
V902	⚠. 8-736-221-05	PICTURE TUBE 07MP G	
V903	⚠. 8-736-222-05	PICTURE TUBE 07MP B	

****

ACCESSORIES & PACKING MATERIALS
****

PART NO.	DESCRIPTION	REMARK
A-1470-928-A	COMMANDER ASS'Y (RM-1271)	
*A-1280-414-A	RC BOARD, COMPLETE	
X-4029-241-2	BAG ASS'Y, WASHER	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION	REMARK
	X-4029-240-2	BAG ASS'Y, WASHER	
	*X-4029-335-1	PLATE ASS'Y, BOTTOM	
	X-4395-576-3	BAG ASS'Y, WASHER	
	X-4395-577-3	BAG ASS'Y, WASHER	
	X-4395-578-1	SPACER (0) ASS'Y, LENS	
	X-4395-579-1	SPACER (2) ASS'Y, LENS	
	1-575-100-11	CABLE, MINIATURE PLUG	
	⚠1-575-175-11	CORD SET, POWER (10A/250V)	
	2-357-277-01	PANEL, FRONT	
	3-562-223-00	TERMINAL BOARD, POSITIVE	
	*3-704-333-01	SHEET (STANDARD), PROTECTION	
	3-754-258-11	MANUAL, INSTRUCTION	
	3-754-259-11	MANUAL, INSTRUCTION	
	*4-030-572-01	PALLET, WOODEN	
	*4-030-574-01	TRAY	
	*4-030-571-01	CUSHION (LOWER) (ASS'Y)	
	4-032-658-01	KEY TOP	
	4-032-660-01	SHEET, RUBBER	
	*4-034-247-01	INDIVIDUAL CARTON	
	4-374-469-01	FOOT, RUBBER	
	*4-388-954-01	BAG, PROTECTION	
	4-395-501-01	KEY TOP	
	4-395-502-01	LID (A)	
	4-395-503-31	LID (B)	
	4-395-504-01	COVER, BATTERY	
	4-395-508-01	CASE, LOWER	
	*4-395-515-01	CUSHION (UPPER) (ASS'Y)	
	*4-395-562-01	SPACER (200S), PICTURE TUBE	
	*4-395-563-01	SPACER (200U), PICTURE TUBE	
	*4-395-564-01	SPACER (72U), PICTURE TUBE	
	*4-395-565-01	SPACER (72S), PICTURE TUBE	
	*4-396-077-01	JOINT	
	*4-396-286-01	SUPPORT	
	*4-396-287-01	SPACER	
	*4-396-288-01	BOX, ACCESSORY	
	*4-396-915-01	HOLDER	

VPH-1251QM
RM-1271

100

SONY
SERVICE MANUAL

AEP Model
Serial No. 5,001,051 and later
Chassis No. SCC-D13C-A

60834

SUPPLEMENT-1

INTRODUCTION

BA, BB, CA(RG) and CA(B) schematic diagrams alteration.

Note)

Please confirm that the part numbers of the set are identical with the numbers of the part number list below before using, when the serial number of the set is not identical with the serial number of the service manual.

Board	Board Part. No
BA	1-639-924-14
BB	1-639-925-14
CA(RG)	1-639-939-13
CA(B)	1-639-940-13

MICROFILM

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

TABLE OF CONTENTS

Section *Title* *Page*

7. DIAGRAMS

7-4. Schematic Diagrams and Printed Wiring Boards ···· 4
BA Board ···· 5
BB Board ···· 20
CA (RG) Board ···· 30
CA (B) Board ···· 40

9. ELECTRICAL PARTS LIST ···· 45

SECTION 7
DIAGRAMS

7-4. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics.
- All electrolytics are in 50V unless otherwise specified.
- All resistors are in ohms, 1/4W in resistance; 1/10W in chip resistance.
  kΩ =1000 Ω , MΩ =1000k Ω
- METAL FILM (:RN) resistors in 1%, 1/6W unless otherwise specified.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- △ : internal component.
- □ : panel designation and adjustment for repair.
- All variable and adjustable resistors have charactristic curve B, unless otherwise noted.

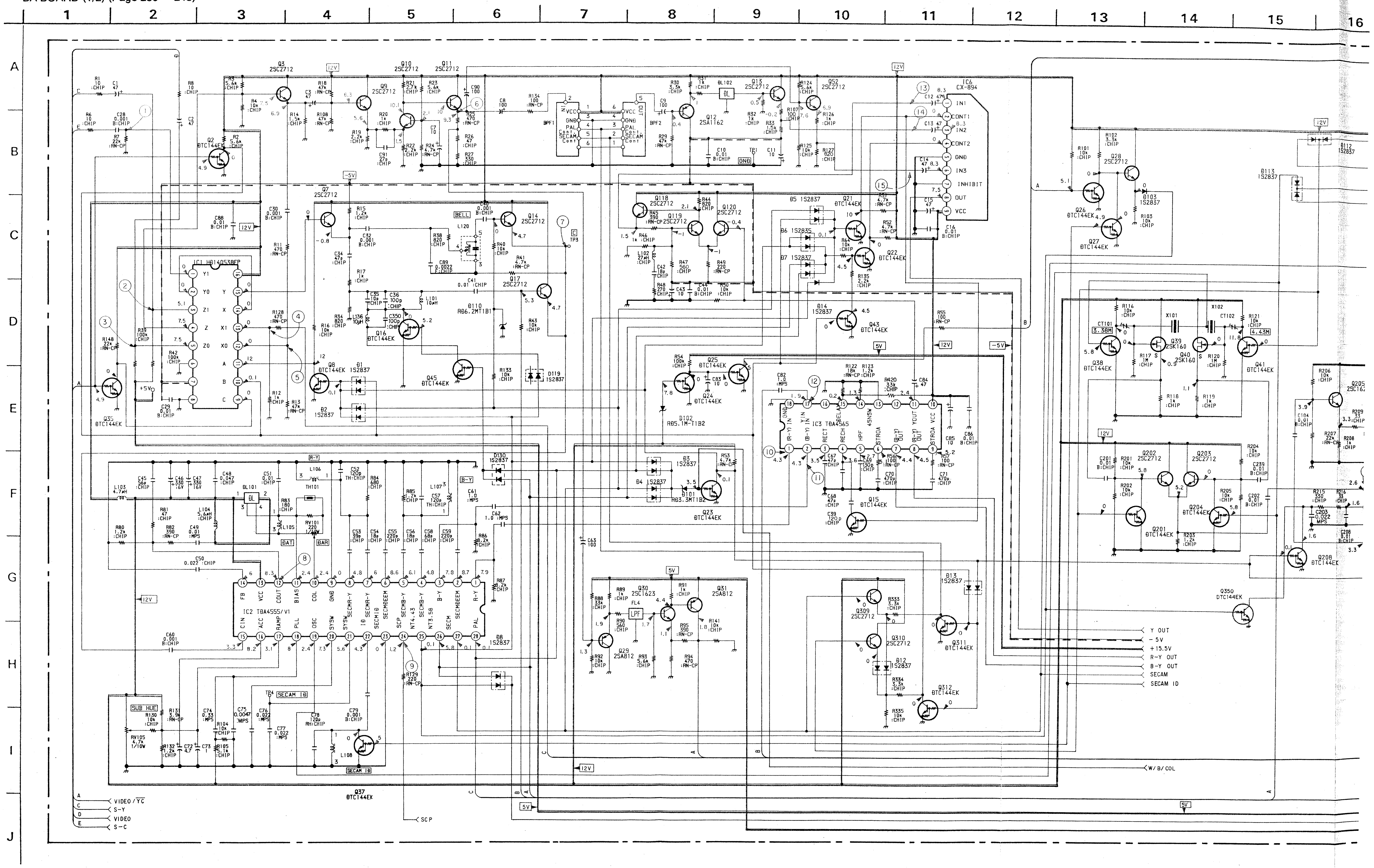
- Voltage value is the reference value between it & the earth, when NTSC 3.58 color bar signal is received from color bar generator (digital multi- meter used : 10M ohms/V DC).
- ☆ : Displays a list of BB, BA board modes.
  (PAL, SECAM, NTSC 3.58, NTSC 4.43, S-VIDEO)
  Displays a list of existing voltages, when board E has issued a white pattern of internal signals.
- Unit of voltage values is V (volt).
- ✕ : Measurement disabled
- □V : B+ line
- □V : B− line
  (Actual measured value may be different).
- Round numerals indicate Waveform Table No.

Reference information

RESISTOR	:	RN	METAL FILM
	:	RC	SOLID
	:	FPRD	NONFLAMMABLE CARBON
	:	FUSE	NONFLAMMABLE FUSIBLE
	:	RS	NONFLAMMABLE METAL OXIDE
	:	RB	NONFLAMMABLE CEMENT
	:	RW	NONFLAMMABLE WIREWOUND
	:	※	ADJUSTMENT RESISTOR
COIL	:	LF-8L	MICRO INDUCTOR
CAPACITOR	:	TA	TANTALUM
	:	PS	STYROL
	:	PP	POLYPROPYLENE
	:	PT	MYLAR
	:	MPS	METALIZED POLYESTER
	:	MPP	METALIZED POLYPROPYLENE
	:	ALB	BIPOLAR
	:	ALT	HIGH TEMPERATURE
	:	ALR	HIGH RIPPLE

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

BA BOARD (1/2) (Page 239 – 243)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A
B
C
D
E
F
G
H
I
J
IC1 HD14053BFP
IC2 TDA4555/V1
IC3 TDA4565
IC6 CX-894
BPF1
BPF2
BL101
BL102
LPF
X101
X102
CT101 3.38M
CT102 4.43M
BELL
SUB HUE
SECAM ID
DAT
DAR
R-Y
B-Y
12V
5V
-5V
+5V
Y OUT
-5V
+15.5V
R-Y OUT
B-Y OUT
SECAM
SECAM ID
W/B/COL
VIDEO/YC
S-Y
VIDEO
S-C
SCP
Q35 DTC144EK
Q37 DTC144EK
Q2 DTC144EK
Q3 2SC2712
Q9 2SC2712
Q10 2SC2712
Q11 2SC2712
Q12 2SA1162
Q13 2SC2712
Q52 2SC2712
Q7 2SC2712
Q14 2SC2712
Q17 2SC2712
Q16 DTC144EK
Q45 DTC144EK
Q8 DTC144EK
Q118 2SC2712
Q119 2SC2712
Q120 2SC2712
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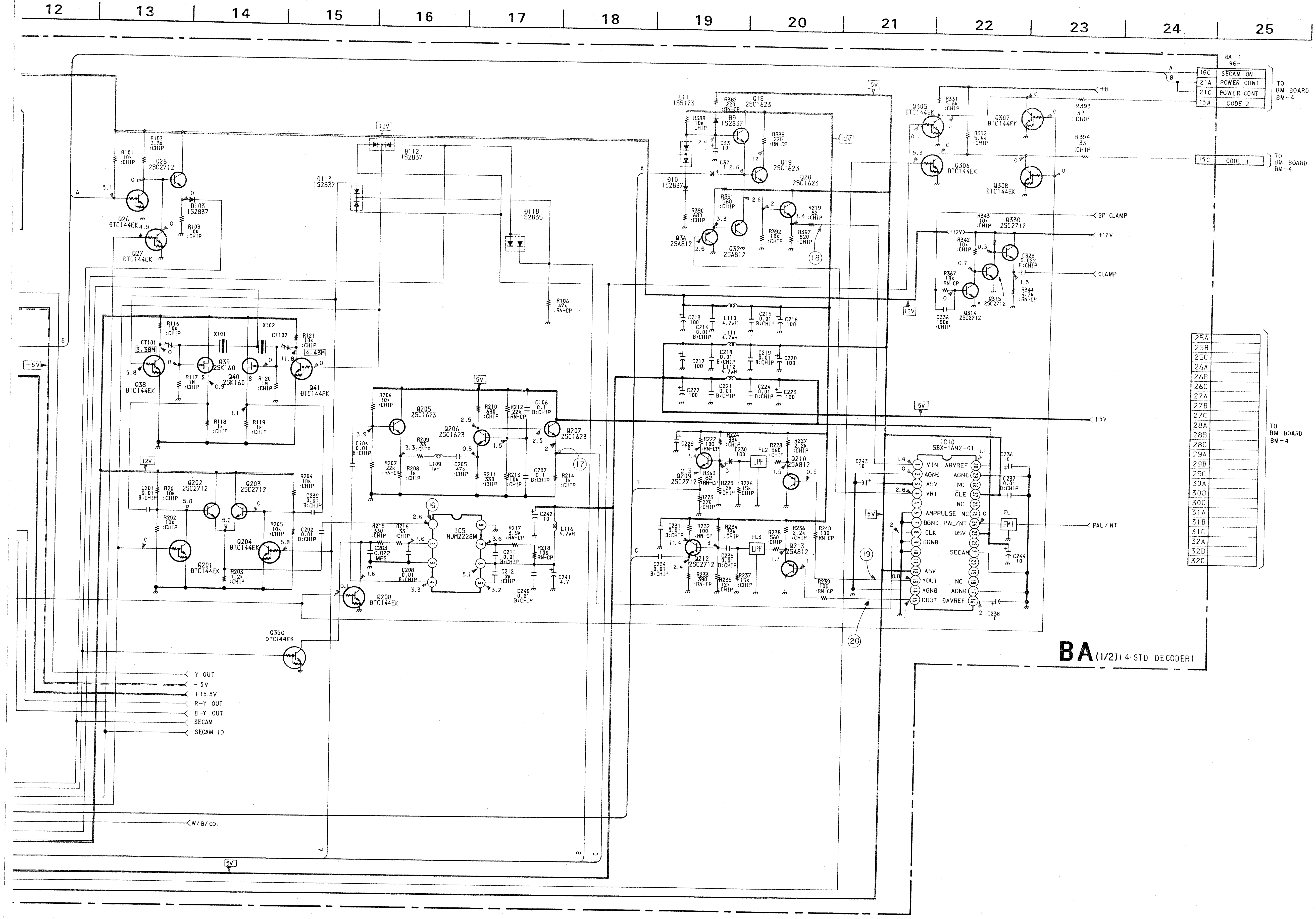
Q22 DTC144EK
Q43 DTC144EK
Q24 DTC144EK
Q25 DTC144EK
Q23 DTC144EK
Q15 DTC144EK
Q26 DTC144EK
Q27 DTC144EK
Q28 2SC2712
Q38 DTC144EK
Q39 2SK160
Q40 2SK160
Q41 DTC144EK
Q201 DTC144EK
Q202 2SC2712
Q203 2SC2712
Q204 DTC144EK
Q205 2SC2712
Q208 DTC144EK
Q350 DTC144EK
Q29 2SA812
Q30 2SC1623
Q31 2SA812
Q309 2SC2712
Q310 2SC2712
Q311 DTC144EK
Q312 DTC144EK
D1 1S2837
D2 1S2837
D3 1S2837
D4 1S2837
D5 1S2837
D6 1S2835
D7 1S2837
D8 1S2837
D12 1S2837
D13 1S2837
D14 1S2837
D101 RD3.3MT1B2
D102 RD5.1M-T1B2
D103 1S2837
D110 RD6.2MT1B1
D112 1S2837
D113 1S2837
D119 1S2837
D130 1S2837
TP1
TP3
TP4
L101 10μH
L102 27μH
L103 4.7μH
L104 5.6μH
L105
L106
L107
L108
L120
L136 10μH
RV101 220
RV105 4.7k 1/10W
TH101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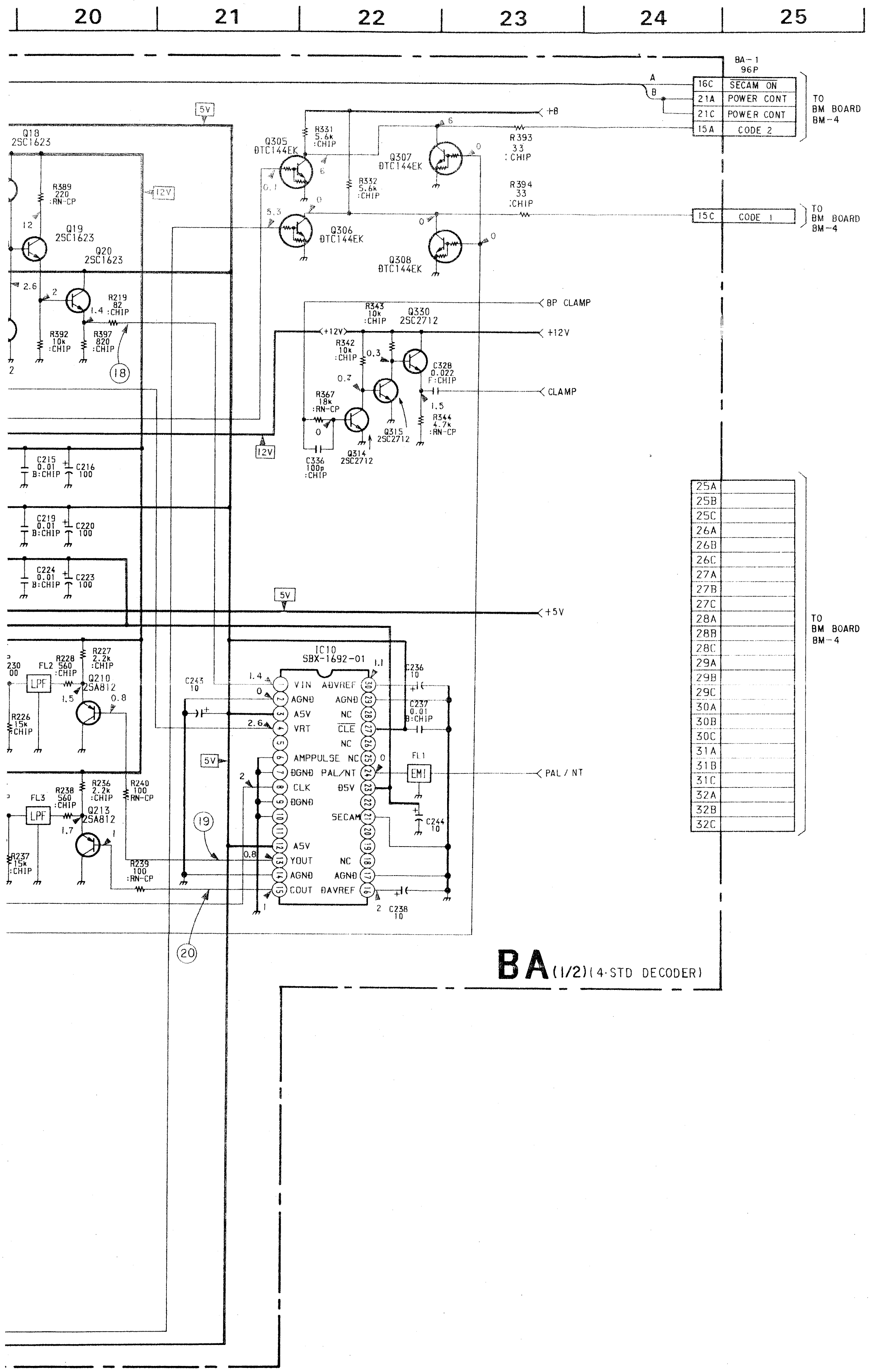
BA-1 96P
16C SECAM ON
21A POWER CONT
21C POWER CONT
15A CODE 2
15C CODE 1
TO BM BOARD BM-4
+8
BP CLAMP
+12V
CLAMP
+5V
PAL / NT
Y OUT
-5V
+15.5V
R-Y OUT
B-Y OUT
SECAM
SECAM ID
W/B/COL
5V
12V
-5V
3.38M
4.43M
X101
X102
CT101
CT102
Q26 DTC144EK
Q27 DTC144EK
Q28 2SC2712
Q38 DTC144EK
Q39 2SK160
Q40 2SK160
Q41 DTC144EK
Q201 DTC144EK
Q202 2SC2712
Q203 2SC2712
Q204 DTC144EK
Q205 2SC1623
Q206 2SC1623
Q207 2SC1623
Q208 DTC144EK
Q350 DTC144EK
IC5 NJM2228M
D112 1S2837
D113 1S2837
D118 1S2835
D11 1SS123
D9 1S2837
D10 1S2837
Q18 2SC1623
Q19 2SC1623
Q20 2SC1623
Q32 2SA812
Q36 2SA812
Q305 DTC144EK
Q306 DTC144EK
Q307 DTC144EK
Q308 DTC144EK
Q330 2SC2712
Q314 2SC2712
Q315 2SC2712
Q209 2SC2712
Q210 2SA812
Q212 2SC2712
Q213 2SA812
LPF
FL2
FL3
FL1
EM1
IC10 SBX-1692-01
VIN
A6VREF
AGND
A5V
NC
VRT
CLE
AMPPULSE
DGND
PAL/NT
CLK
D5V
SECAM
YOUT
COUT
BAVREF
⑯
⑰
⑱
⑲
⑳
A
B
C
25A
25B
25C
26A
26B
26C
27A
27B
27C
28A
28B
28C
29A
29B
29C
30A
30B
30C
31A
31B
31C
32A
32B
32C
BA (1/2) (4-STD DECODER)

BA (1/2)	IC1	HD14053BFP	SYSTEM SW-1	202	2
	2	TDA4555/V1	DECODER	203	2
	3	TDA4565	TRANSIENT	204	D
	5	NJM2228M	CLK GEN	205	2
	6	CX-894	VIDEO AMP	206	2
	10	SBX1692-01	COMB FILTER	207	2
				208	D
	Q2	DTC144EK	MODE SW-1	209	2
	3	2SC2712	VIDEO BUFF-1	210	2
	7	2SC2712	C BUFF	212	2
	8	DTC144EK	MODE SW-1	213	2
	9	2SC2712	VIDEO AMP-1	305	D
	10	2SC2712	VIDEO AMP-2	306	D
	11	2SC2712	VIDEO AMP-3	307	D
	12	2SA1162	Y BUFF-1	308	D
	13	2SC2712	Y BUFF-2	309	2
	14	2SC2712	SECAM C BUFF	310	2
	15	DTC144EK	MODE SW-10	311	D
	16	DTC144EK	C FILTER SW	312	D
	17	2SC2712	NT/PAL C BUFF	314	2
	18	2SC1623	CLAMP-4	315	2
	19	2SC1623	CLAMP-6	330	2
	20	2SC1623	NT/PAL VIDEO BUFF	350	D
	21	DTC144EK	Y MODE SW-6		
	22	DTC144EK	Y MODE SW-7	D1	1
	23	DTC144EK	B/W SW-4	2	1
	24	DTC144EK	POWER CONT-1	3	1
	25	DTC144EK	POWER CONT-2	4	1
	26	DTC144EK	SECAM SW-1	5	1
	27	DTC144EK	SECAM SW-2	6	1
	28	2SC2712	SECAM SW-3	7	1
	29	2SA812	NT/PAL VIDEO	8	1
	30	2SC1623	NT/PAL VIDEO AMP-1	9	1
	31	2SA812	NT/PAL VIDEO AMP-2	10	1
	32	2SA812	CLAMP-5	11	1
	35	DTC144EK	MODE SW-2	12	1
	36	2SA812	CLAMP	13	1
	37	DTC144EK	ID	14	1
	38	DTC144EK	NT OSC SW	101	R
	39	2SK160	NT CLK BUFF-1	102	R
	40	2SK160	PAL CLK BUFF-2	103	1
	41	DTC144EK	PAL OSC SW	110	R
	43	DTC144EK	Y MODE SW-5	112	1
	45	DTC144EK	C FILTER SW	113	1
	52	2SC2712	VIDEO BUFF-2	118	1
	118	2SC2712	NT/PAL Y AMP-3	119	1
	119	2SC2712	NT/PAL Y AMP-1	130	1
	120	2SC2712	NT/PAL Y AMP-2		
	201	DTC144EK	NT CLK SW		

BA BOARD (1/2)

REF	Pin No.	NTSC 3.58	PAL	SECAM	NTSC 4.43
IC1	②	0	0	−0.7	−0.7
	⑪	12	12	0	0
	⑫	0	0	−0.7	−0.7
	⑭	0	0	−0.7	−0.7
	⑮	0	0	−0.7	−0.7
IC2	⑤	6.1	5.8	4.2	7.6
	⑦	6	5.5	4.2	7.3
	⑲	2.4	2.4	5.6	2.4
	⑳	7.5	5.7	5.7	7.5
	㉑	5.6	7.7	6.8	5.6
	㉕	0.1	0.1	0.1	5.8
	㉖	5.8	0.1	0.1	0.1
	㉗	0.1	0.1	5.8	0.1
	㉘	0.1	5.8	0.1	0.1
IC6	②	10	0	0	10
	④	0	10	10	0
IC10	㉔	0	3.6	3.6	0

REF		NTSC 3.58	PAL
Q7	B	0	0
	C	–	–
	E	−0.8	−0.8
Q8	B	0.1	0.1
	C	12	12
	E	–	–
Q16	B	5.2	0.2
	C	0	3.5
	E	–	–
Q17	B	5.3	5.3
	C	4.7	4.7
	E	–	–
Q21	B	0.1	0.1
	C	0	0
	E	–	–
Q22	B	4.5	4.5
	C	0	0
	E	–	–
Q27	B	4.9	0
	C	0	0
	E	–	–
Q37	B	5	0
	C	0	0
	E	–	–
Q38	B	5.7	0
	C	0	11.7
	E	–	–
Q41	B	0	5.9
	C	11.8	0
	E	–	–
Q43	B	0	0
	C	4.5	4.5
	E	–	–
Q201	B	0	5.2
	C	5.8	0
	E	–	–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21
22
23
24
25
BA-1 96P
16C SECAM ON
21A POWER CONT
21C POWER CONT
15A CODE 2
TO BM BOARD BM-4
15C CODE 1
TO BM BOARD BM-4
+B
Q305 DTC144EK
R331 5.6k :CHIP
Q307 DTC144EK
R393 33 :CHIP
R332 5.6k :CHIP
R394 33 :CHIP
Q306 DTC144EK
Q308 DTC144EK
Q18 2SC1623
R389 220 :RN-CP
Q19 2SC1623
Q20 2SC1623
R219 82 :CHIP
R392 10k :CHIP
R397 820 :CHIP
18
BP CLAMP
R343 10k :CHIP
Q330 2SC2712
+12V
R342 10k :CHIP
C328 0.022 F:CHIP
CLAMP
R367 18k :RN-CP
R344 4.7k :RN-CP
Q315 2SC2712
Q314 2SC2712
C336 100p :CHIP
5V
12V
C215 0.01 B:CHIP
C216 100
C219 0.01 B:CHIP
C220 100
C224 0.01 B:CHIP
C223 100
+5V
25A 25B 25C 26A 26B 26C 27A 27B 27C 28A 28B 28C 29A 29B 29C 30A 30B 30C 31A 31B 31C 32A 32B 32C
TO BM BOARD BM-4
IC10 SBX-1692-01
VIN AGND ASV VRT AMPPULSE DGND CLK DGND ASV YOUT AGND COUT
ADVREF AGND NC CLE NC NC PAL/NT D5V SECAM NC AGND DAVREF
C243 10
C236 10
C237 0.01 B:CHIP
FL1 EMI
PAL / NT
C244 10
C238 10
R228 560 :CHIP
R227 2.2k :CHIP
FL2 LPF
Q210 2SA812
R226 15k :CHIP
R238 560 :CHIP
R236 2.2k :CHIP
R240 100 :RN-CP
FL3 LPF
Q213 2SA812
R237 15k :CHIP
R239 100 :RN-CP
19
20
BA(1/2)(4-STD DECODER)

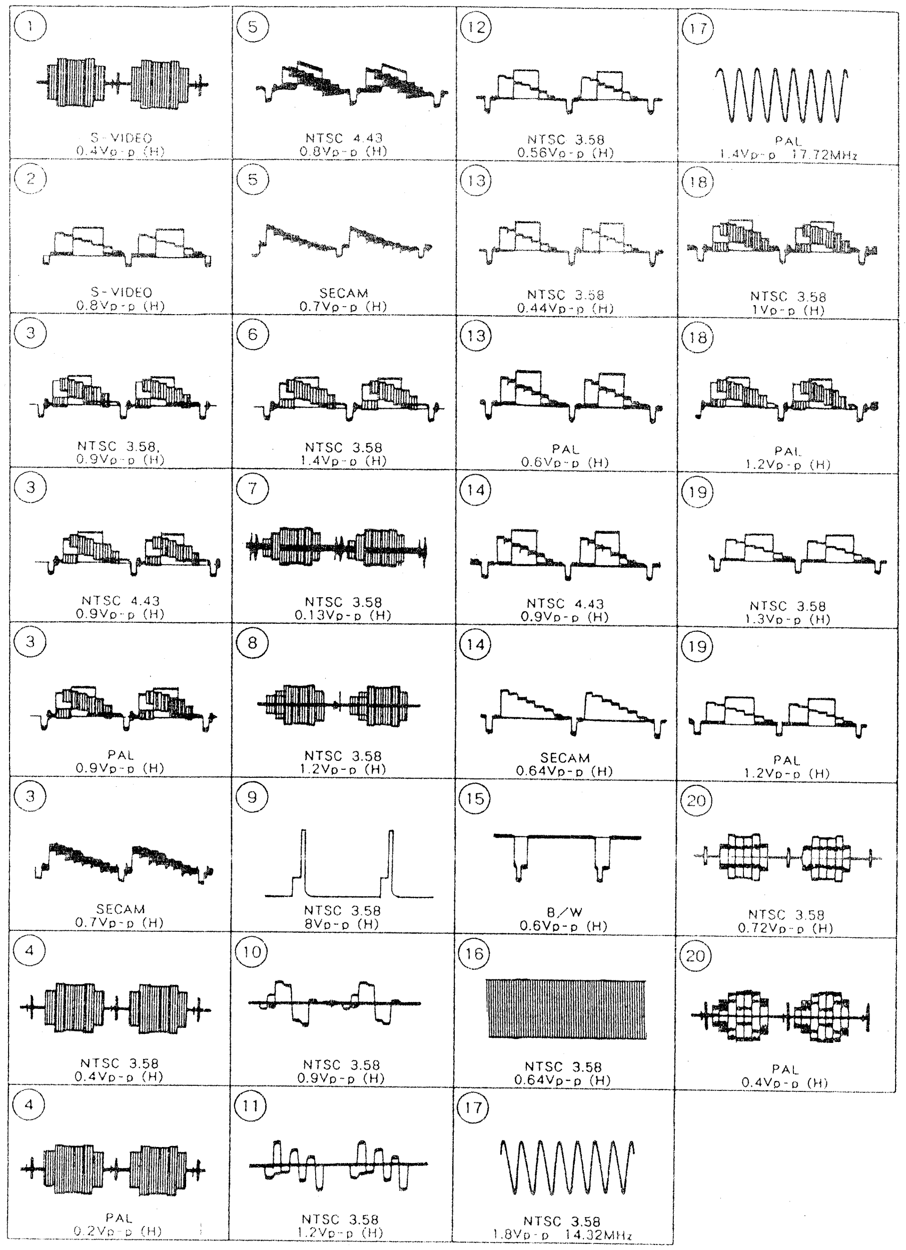
BA (1/2)	IC1	HD14053BFP	SYSTEM SW-1	202	2SC2712	CLK BUFF-3
	2	TDA4555/V1	DECODER	203	2SC2712	CLK BUFF-4
	3	TDA4565	TRANSIENT	204	DTC144EK	PAL CLK SW
	5	NJM2228M	CLK GEN	205	2SC1623	CLK AMP-1
	6	CX-894	VIDEO AMP	206	2SC1623	CLK AMP-2
	10	SBX1692-01	COMB FILTER	207	2SC1623	CLK AMP-3
				208	DTC144EK	GEN SW
	Q2	DTC144EK	MODE SW-1	209	2SC2712	NT/PAL Y BUFF-2
	3	2SC2712	VIDEO BUFF-1	210	2SA812	NT/PAL Y BUFF-1
	7	2SC2712	C BUFF	212	2SC1712	NT/PAL C BUFF-2
	8	DTC144EK	MODE SW-1	213	2SA812	NT/PAL C BUFF-1
	9	2SC2712	VIDEO AMP-1	305	DTC144EK	CODE 2 SW-1
	10	2SC2712	VIDEO AMP-2	306	DTC144EK	CODE 1 SW-1
	11	2SC2712	VIDEO AMP-3	307	DTC144EK	CODE SW-2
	12	2SA1162	Y BUFF-1	308	DTC144EK	CODE SW-2
	13	2SC2712	Y BUFF-2	309	2SC2712	NT3.58 SW
	14	2SC2712	SECAM C BUFF	310	2SC2712	NT4.43 SW
	15	DTC144EK	MODE SW-10	311	DTC144EK	TRAP SW
	16	DTC144EK	C FILTER SW	312	DTC144EK	TRAP SW
	17	2SC2712	NT/PAL C BUFF	314	2SC2712	CLAMP BUFF-1
	18	2SC1623	CLAMP-4	315	2SC2712	CLAMP BUFF-2
	19	2SC1623	CLAMP-6	330	2SC2712	CLAMP BUFF-3
	20	2SC1623	NT/PAL VIDEO BUFF	350	DTC144ES	GEN SW
	21	DTC144EK	Y MODE SW-6			
	22	DTC144EK	Y MODE SW-7	D1	1S2837	SYSTEM DET-1
	23	DTC144EK	B/W SW-4	2	1S2837	SYSTEM DET-2
	24	DTC144EK	POWER CONT-1	3	1S2837	B/W SW-1
	25	DTC144EK	POWER CONT-2	4	1S2837	B/W SW-2
	26	DTC144EK	SECAM SW-1	5	1S2837	Y MODE SW-1
	27	DTC144EK	SECAM SW-2	6	1S2835	Y MODE SW-2
	28	2SC2712	SECAM SW-3	7	1S2837	Y MODE SW-3
	29	2SA812	NT/PAL VIDEO	8	1S2837	MODE SW-3
	30	2SC1623	NT/PAL VIDEO AMP-1	9	1S2837	CLAMP-3
	31	2SA812	NT/PAL VIDEO AMP-2	10	1S2837	CLAMP-2
	32	2SA812	CLAMP-5	11	1SS123	CLAMP-1
	35	DTC144EK	MODE SW-2	12	1S2837	NT3.58 DET
	36	2SA812	CLAMP	13	1S2837	MODE SW-11
	37	DTC144EK	ID	14	1S2837	Y MODE SW-4
	38	DTC144EK	NT OSC SW	101	RD3.3M-B2	B/W SW-3
	39	2SK160	NT CLK BUFF-1	102	RD5.1M-B2	POWER CONT
	40	2SK160	PAL CLK BUFF-2	103	1S2837	SECAM SW-4
	41	DTC144EK	PAL OSC SW	110	RD6.2M-B1	SECAM SW
	43	DTC144EK	Y MODE SW-5	112	1S2837	MODE SW-4
	45	DTC144EK	C FILTER SW	113	1S2837	MODE SW-5
	52	2SC2712	VIDEO BUFF-2	118	1S2835	MODE SW-6
	118	2SC2712	NT/PAL Y AMP-3	119	1S2837	C FILTER SW
	119	2SC2712	NT/PAL Y AMP-1	130	1SS119	C FILTER SW
	120	2SC2712	NT/PAL Y AMP-2			
	201	DTC144EK	NT CLK SW			

BA BOARD (1/2)

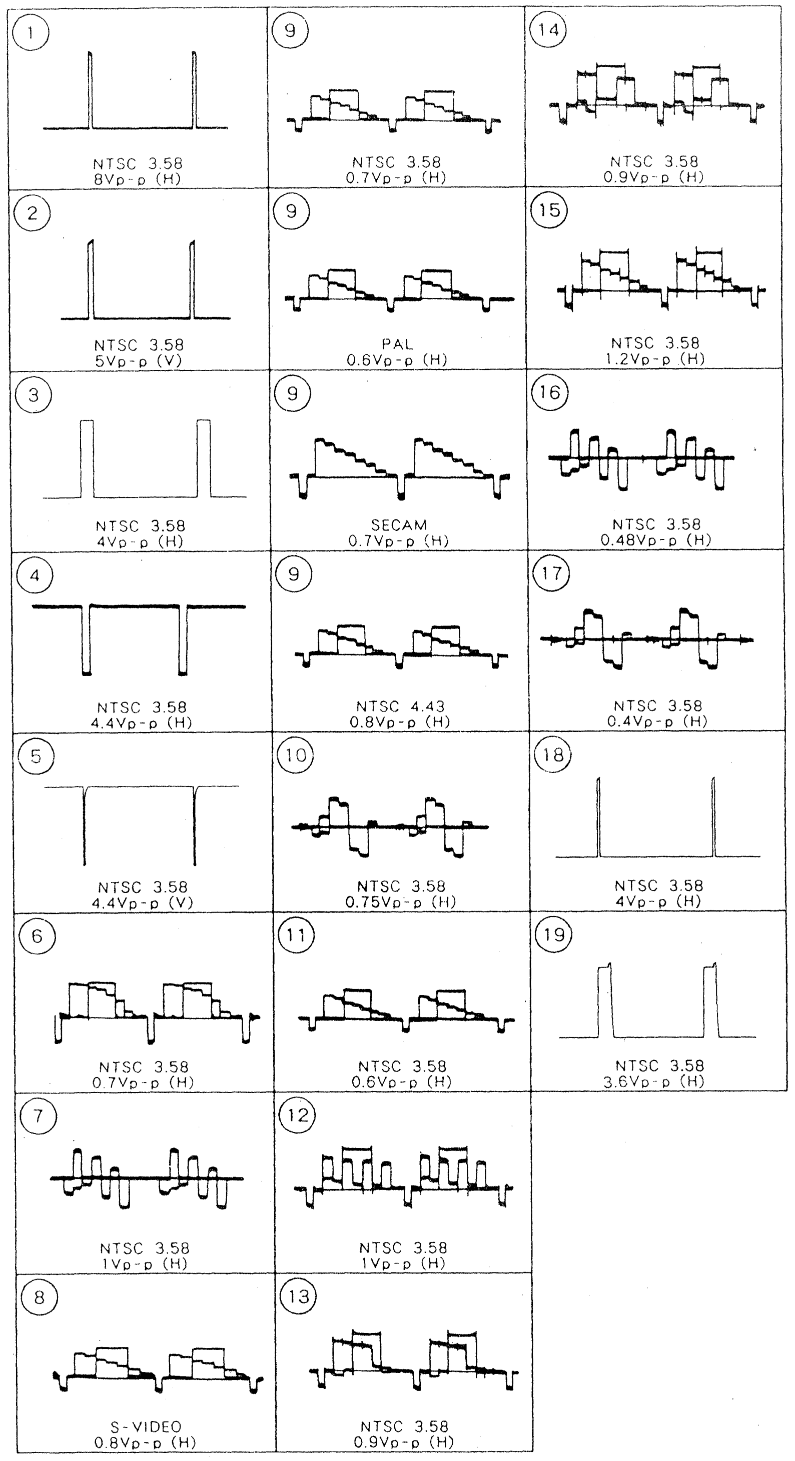
REF	Pin No.	NTSC 3.58	PAL	SECAM	NTSC 4.43
IC1	②	0	0	-0.7	-0.7
	⑪	12	12	0	0
	⑫	0	0	-0.7	-0.7
	⑭	0	0	-0.7	-0.7
	⑮	0	0	-0.7	-0.7
IC2	⑤	6.1	5.8	4.2	7.6
	⑦	6	5.5	4.2	7.3
	⑲	2.4	2.4	5.6	2.4
	⑳	7.5	5.7	5.7	7.5
	㉑	5.6	7.7	6.8	5.6
	㉕	0.1	0.1	0.1	5.8
	㉖	5.8	0.1	0.1	0.1
	㉗	0.1	0.1	5.8	0.1
	㉘	0.1	5.8	0.1	0.1
IC6	②	10	0	0	10
	④	0	10	10	0
IC10	㉔	0	3.6	3.6	0

REF		NTSC 3.58	PAL	SECAM	NTSC 4.43	REF		NTSC 3.58	PAL	SECAM	NTSC 4.43
Q7	B	0	0	-0.8	-0.8	Q202	B	5.8	0	5.8	0
	C	–	–	–	–		C	–	–	–	–
	E	-0.8	-0.8	-1.4	-1.4		E	5.2	5.1	5.2	5.1
Q8	B	0.1	0.1	5.3	5.3	Q203	B	0	5.8	5.8	5.8
	C	12	12	0	0		C	–	–	–	–
	E	–	–	–	–		E	5.2	5.1	5.2	5.1
Q16	B	5.2	0.2	0.2	5.2	Q204	B	5.8	0	0	0
	C	0	3.5	1.5	0		C	0	5.8	5.8	5.8
	E	–	–	–	–		E	–	–	–	–
Q17	B	5.3	5.3	0.2	5.3	Q305	B	0.1	5.8	0.1	0.1
	C	4.7	4.7	5	4.7		C	6	0	6	6
	E	–	–	–	–		E	–	–	–	–
Q21	B	0.1	0.1	5.3	5.3	Q306	B	5.3	0.1	0.1	5.3
	C	0	0	0	0		C	0	6	6	0
	E	–	–	–	–		E	–	–	–	–
Q22	B	4.5	4.5	0.5	0.5	Q307	B	0	0	0	0
	C	0	0	10	10		C	6	0	6	6
	E	–	–	–	–		E	–	–	–	–
Q27	B	4.9	0	0	4.9	Q308	B	0	0	0	0
	C	0	0	0	0		C	0	6	6	6
	E	–	–	–	–		E	–	–	–	–
Q37	B	5	0	0	5	Q309	B	0	0	5.7	0
	C	0	0	0	0		C	–	–	–	–
	E	–	–	–	–		E	0	0	5.1	0
Q38	B	5.7	0	0	0	Q310	B	0	5.1	0	5.1
	C	0	11.7	11.7	11.7		C	–	–	–	–
	E	–	–	–	–		E	0	4.5	1.4	4.5
Q41	B	0	5.9	0	5.1	Q311	B	0	0.5	0.2	0.5
	C	11.8	0	11.8	0		C	0	0	3.8	2.8
	E	–	–	–	–		E	–	–	–	–
Q43	B	0	0	0	0	Q312	B	0	0.5	0.2	0.5
	C	4.5	4.5	0.5	0.5		C	0	2.8	3.2	2.8
	E	–	–	–	–		E	–	–	–	–
Q201	B	0	5.2	0	5.2						
	C	5.8	0	5.8	0						
	E	–	–	–	–						

BA BOARD (1/2)



BA BOARD (2/2)



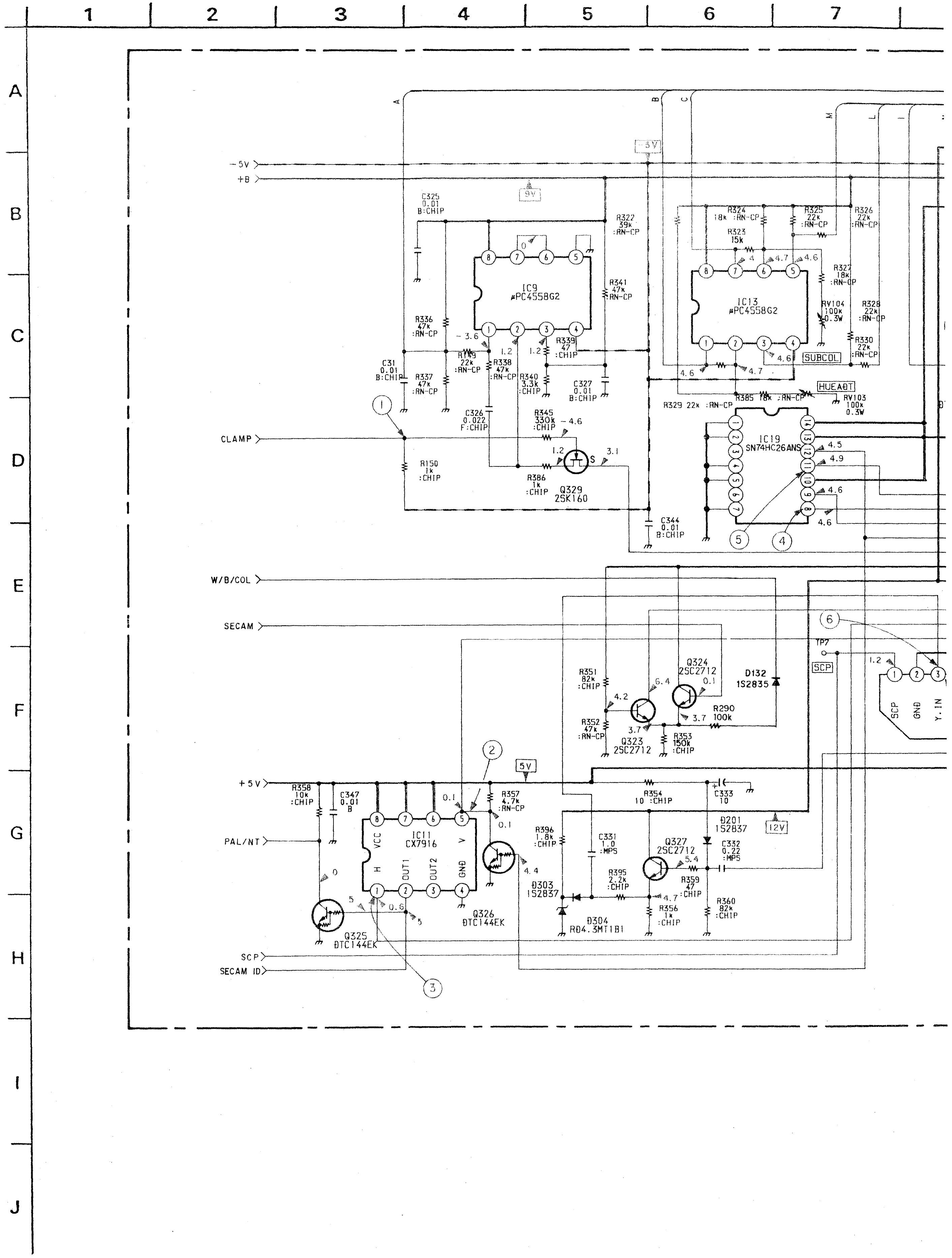
BA (2/2)	IC7	HD14053BFP	SYSTEM SW-2
	8	CXA1216P	MATRIX
	9	μPC4558G2	BRT CONT-2
	11	CX-7916	50/60 DET
	12	SNY-9202	SHARPNESS
	13	μPC4558G2	LEVEL SHIFT-1
	14	SN74LS12NS	MODE DET
	15	H8B7178B	JUNGLE
	16	LM7812CT	12V REG
	17	PQ05RF1	5V REG
	19	SN74HC126ANS	SYNC BUFF
	Q33	2SC2712	R-Y BUFF-1
	34	2SC2712	B-Y BUFF-1
	48	2SC2712	R-Y AMP-1
	49	2SC2712	R-Y AMP-2
	50	2SC2712	B-Y AMP-1
	51	2SC2712	B-Y AMP-2
	152	DTC144EK	SYSTEM MODE SW-2
	301	2SD774	9V REG
	302	2SC2712	BLK BUFF-1
	303	2SC2712	B-Y BUFF-2
	304	2SC2712	R-Y BUFF-2
	313	2SC2712	Y AMP-3
	317	2SC2712	Y AMP-2
	318	2SC2712	Y AMP
	319	DTC144EK	MODE SW-7
	320	DTC144EK	MODE SW-8
	321	DTC144EK	MODE SW-9
	323	2SC2712	REF DC BUFF
	324	2SC2712	BGP SHIFT
	325	DTC144EK	50/60 SW
	326	DTC144EK	V SYNC SW
	327	2SC2712	Y CLAMP-2
	329	2SK160	BRT CONT-1
	336	2SC2712	Y AMP-6
	337	2SA812	Y AMP-5
	338	2SC2712	Y AMP-4
	340	DTC144EK	MODE DET
	351	2SC2712	CLIP BUFF
	352	2SC2712	CLIP BUFF
	D107	1S2837	BLK ADD-2
	108	V06C	+12V PROT
	109	V06C	+5V PROT
	132	1S2835	
	201	1S2837	Y CLAMP-1
	301	1S2837	LEVEL SHIFT-2
	303	1S2837	Y LEVEL ADJ-2
	304	RD4.3M-B1	Y LEVEL ADJ-1
	350	1S2837	CLIP
	351	1S2837	CLIP
	352	1S2837	CLIP

BA BOARD (2/2)

REF	Pin No.	NTSC 3.58	PAL	SECAM	NTSC 4.43
IC11	②	5	0	0	5

REF		NTSC 3.58	PAL	SECAM	NTSC 4.43
Q325	B	5	0	0	5
	C	0	3.6	3.6	0
	E	–	–	–	–

BA BOARD (2/2)
(Page 244 – 248)


1
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4
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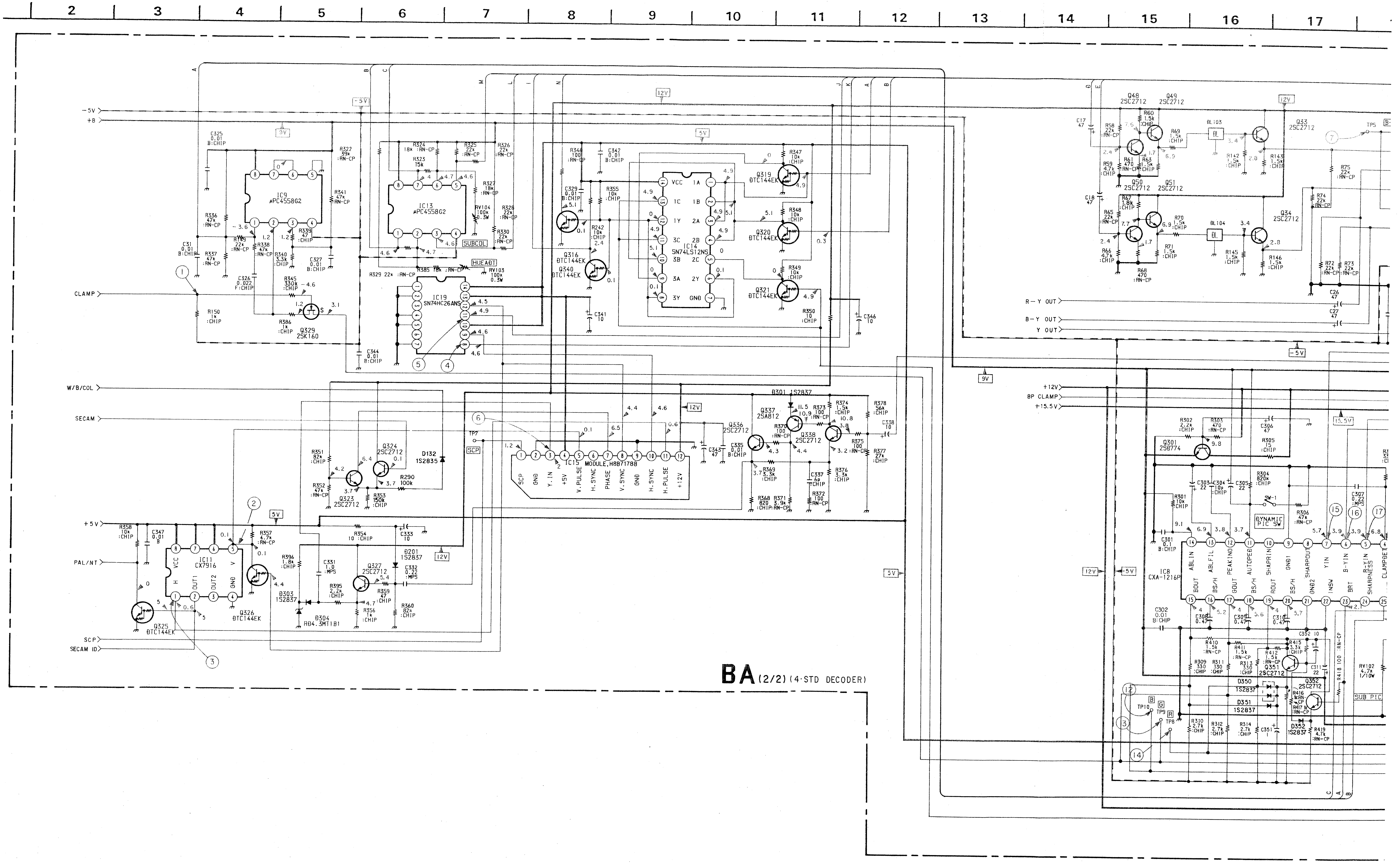
6
7
A
B
C
D
E
F
G
H
I
J
−5V
+B
CLAMP
W/B/COL
SECAM
+5V
PAL/NT
SCP
SECAM ID
IC9 μPC4558G2
IC13 μPC4558G2
IC19 SN74HC126ANS
IC11 CX7916
Q329 2SK160
Q323 2SC2712
Q324 2SC2712
Q327 2SC2712
Q325 DTC144EK
Q326 DTC144EK
D132 1S2835
D201 1S2837
D303 1S2837
D304 RD4.3M-B1
RV104 100k 0.3W
RV103 100k 0.3W
SUBCOL
HUEADJ
SCP
TP7
9V
5V
12V
①
②
③
④
⑤
⑥
SCP
GND
Y.IN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8
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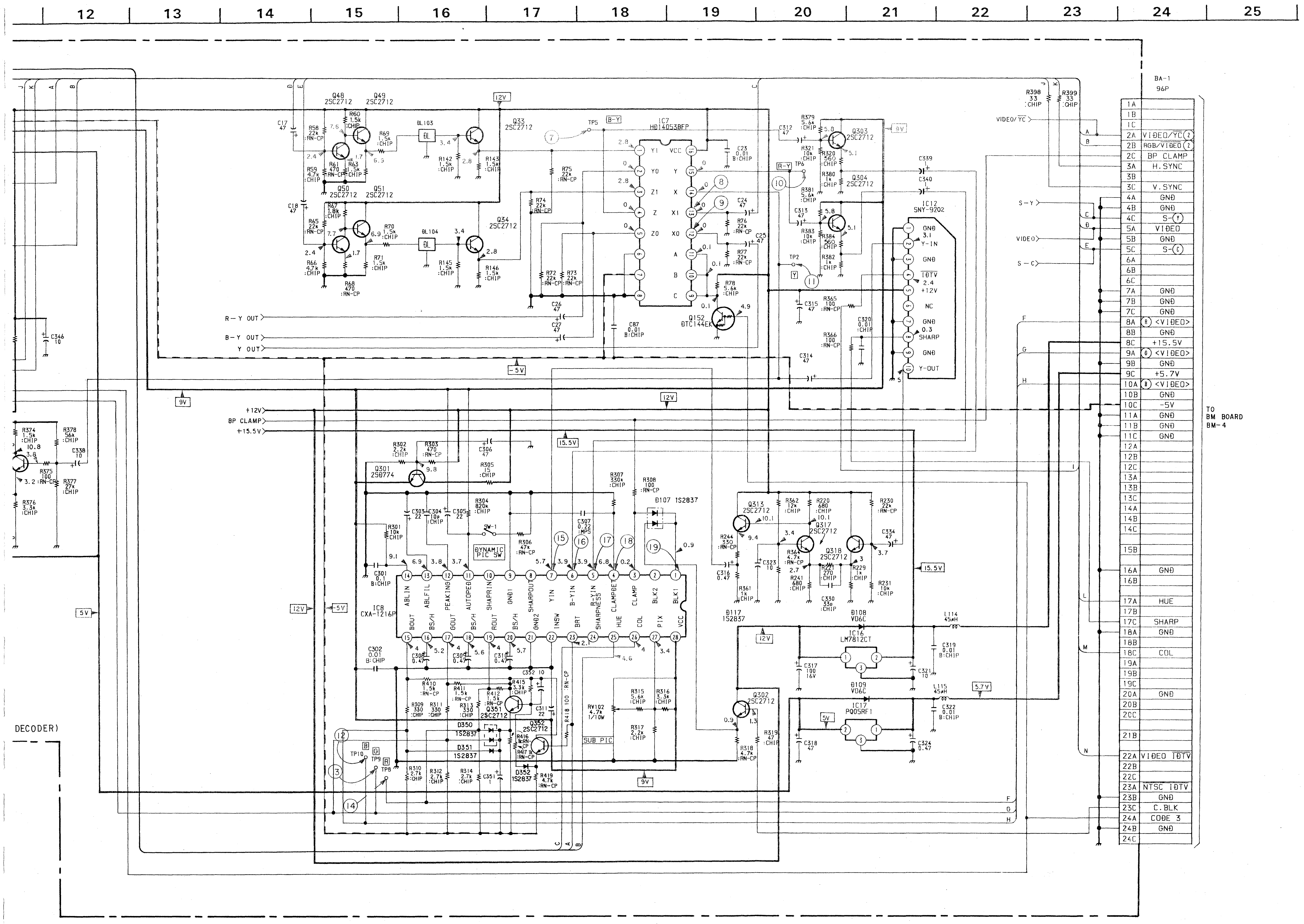
10
11
12
13
14
15
16
17
-5V
+B
CLAMP
W/B/COL
SECAM
+5V
PAL/NT
SCP
SECAM ID
IC9 μPC4558G2
IC13 μPC4558G2
IC19 SN74HC26ANS
IC14 SN74LS12NS
IC15 MODULE, H8B7178B
IC11 CX7916
IC8 CXA-1216P
Q329 2SK160
Q316 DTC144EK
Q340 DTC144EK
Q319 DTC144EK
Q320 DTC144EK
Q321 DTC144EK
Q323 2SC2712
Q324 2SC2712
Q325 DTC144EK
Q326 DTC144EK
Q327 2SC2712
Q336 2SC2712
Q337 2SA812
Q338 2SC2712
Q301 2SB774
Q351 2SC2712
Q352 2SC2712
Q48 2SC2712
Q49 2SC2712
Q50 2SC2712
Q51 2SC2712
Q33 2SC2712
Q34 2SC2712
D132 1S2835
D201 1S2837
D303 1S2837
D304 RD4.3MT1B1
D301 1S2837
D350 1S2837
D351 1S2837
D352 1S2837
BL103
BL104
RV103 100k 0.3W
RV104 100k 0.3W
RV102 4.7k 1/10W
SUBCOL
HUEADT
DYNAMIC PIC SW
SUB PIC
TP5
TP7
TP8
TP9
TP10
R-Y OUT
B-Y OUT
Y OUT
+12V
BP CLAMP
+15.5V
12V
5V
9V
-5V
15.5V
SCP
GND
Y.IN
+5V
V.PULSE
H.SYNC
PHASE
V.SYNC
GND
H.SYNC
H.PULSE
+12V
ABLIN
ABLFIL
PEAKING
AUTOPED
SHARPIN
GND1
SHARPOUT
YIN
B-YIN
R-YIN
SHARPNESS
CLAMPE
BOUT
BS/H
GOUT
BS/H
ROUT
BS/H
GND2
INSW
BRT
VCC
1A
1B
1C
1Y
2A
2B
2C
2Y
3A
3B
3C
3Y
GND
OUT1
OUT2
H
V

BA (2/2) (4·STD DECODER)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25
IC7 HD14053BFP
IC8 CXA-1216P
IC12 SNY-9202
IC16 LM7812CT
IC17 PQ05RF1
Q48 2SC2712
Q49 2SC2712
Q50 2SC2712
Q51 2SC2712
Q33 2SC2712
Q34 2SC2712
Q152 DTC144EK
Q301 2SB774
Q303 2SC2712
Q304 2SC2712
Q313 2SC2712
Q317 2SC2712
Q318 2SC2712
Q302 2SC2712
Q351 2SC2712
Q352 2SC2712
BL103
BL104
D107 1S2837
D108 V06C
D109 V06C
D117 1S2837
D350 1S2837
D351 1S2837
D352 1S2837
L114 45μH
L115 45μH
RV102 4.7k 1/10W
SUB PIC
DYNAMIC PIC SW
SW-1
R-Y OUT
B-Y OUT
Y OUT
+12V
BP CLAMP
+15.5V
12V
9V
-5V
15.5V
5V
5.7V
TP5
TP6
TP2
TP8
TP9
TP10
ABLIN
ABLFIL
PEAKING
AUTOPED
SHAPRIN
GND1
SHARPOUT
YIN
B-YIN
R-YIN
SHARPNESS
CLAMPDET
CLAMP
BLK2
BLK1
BOUT
BS/H
GOUT
ROUT
GND2
INSW
BRT
HUE
COL
PIX
VCC
Y-IN
IDTV
+12V
NC
SHARP
Y-OUT
GND
VIDEO/YC
S-Y
VIDEO
S-C
BA-1 96P
1A
1B
1C
2A VIDEO/YC (2)
2B RGB/VIDEO (2)
2C BP CLAMP
3A H.SYNC
3B
3C V.SYNC
4A GND
4B GND
4C S-(Y)
5A VIDEO
5B GND
5C S-(C)
6A
6B
6C
7A GND
7B GND
7C GND
8A (R) <VIDEO>
8B GND
8C +15.5V
9A (G) <VIDEO>
9B GND
9C +5.7V
10A (B) <VIDEO>
10B GND
10C -5V
11A GND
11B GND
11C GND
12A
12B
12C
13A
13B
13C
14A
14B
14C
15B
16A GND
16B
17A HUE
17B
17C SHARP
18A GND
18B
18C COL
19A
19B
19C
20A GND
20B
20C
21B
22A VIDEO IDTV
22B
22C
23A NTSC IDTV
23B GND
23C C.BLK
24A CODE 3
24B GND
24C
TO BM BOARD BM-4
DECODER)

BA BOARD (COMPONENT SIDE)

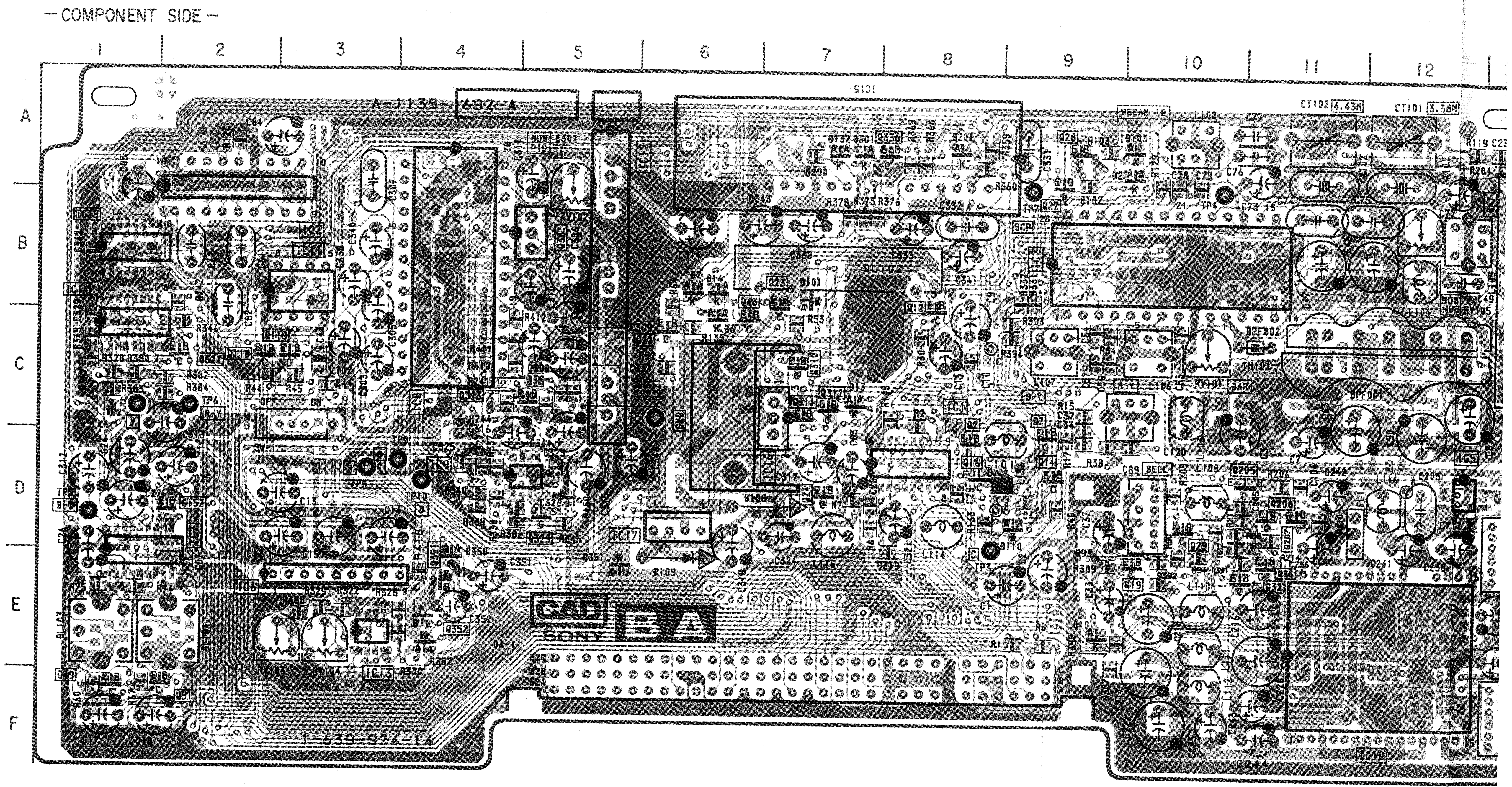
IC	
IC1	D-8
IC2	B-9
IC3	B-3
IC5	D-12
IC6	E-2
IC7	E-1
IC8	C-4
IC9	D-4
IC10	F-12
IC11	B-3
IC12	A-5
IC13	E-3
IC14	C-1
IC15	A-7
IC16	D-7
IC17	D-6
IC19	B-1

TRANSISTOR	
Q2	D-8
Q7	C-9
Q12	B-8
Q14	D-9
Q16	D-8
Q19	E-10
Q22	C-6
Q23	B-7
Q24	D-7
Q27	A-9
Q28	A-9
Q29	D-10
Q32	E-11
Q36	E-11
Q43	C-6
Q49	F-1
Q51	F-2
Q118	C-2
Q119	C-3
Q152	D-2
Q205	D-11
Q206	D-11
Q207	D-11
Q301	B-5
Q310	C-7
Q311	C-7
Q312	C-7
Q313	C-5
Q321	C-2
Q329	D-5
Q336	A-8
Q351	E-4
Q352	E-4

DIODE	
D2	A-10
D6	C-6
D7	B-6
D10	E-9
D13	C-7
D14	B-6
D101	B-7
D103	A-10
D108	D-7
D109	E-6
D110	D-9
D132	A-7
D201	A-8
D301	A-7
D350	E-4
D351	E-5
D352	E-4

ADJUSTING ELEMENT	
CT101	A-12
CT102	A-11
RV101	C-10
RV102	B-5
RV103	E-2
RV104	E-3
RV105	B-12

– **BA BOARD** – (Page 249 – 253)


– COMPONENT SIDE –
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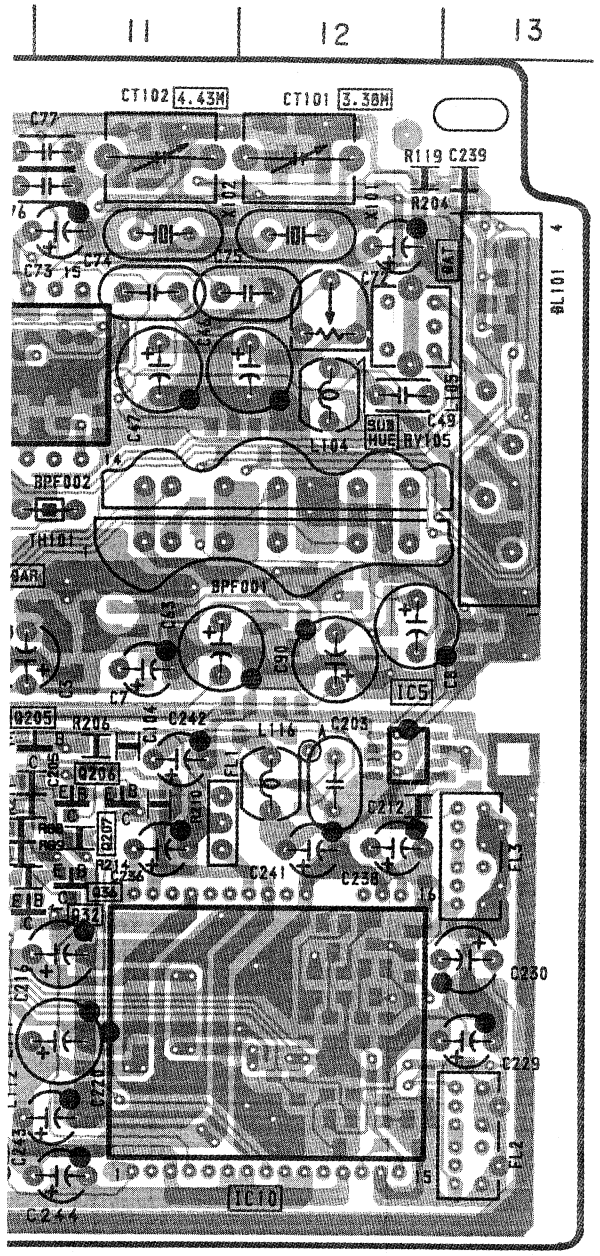
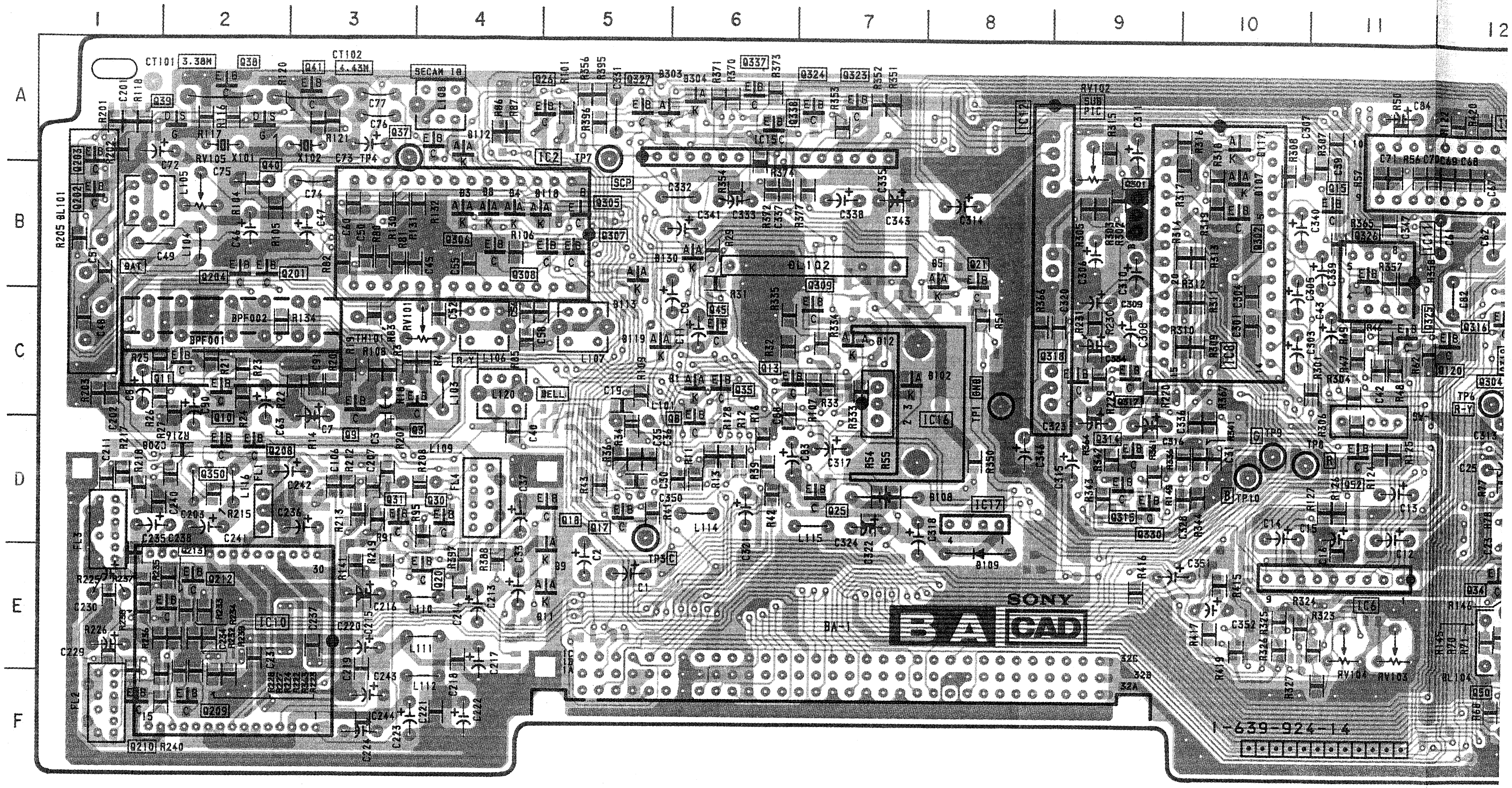
12
A
B
C
D
E
F
A-1135-692-A
1-639-924-14
CAD
SONY
BA
SECAM
CT102 4.43M
CT101 3.58M
BELL
SUB HUE
BPF001
BPF002
BL102
IC15
IC12
IC10


11
12
13
CT102 4.43M
CT101 3.38M
R119 C239
R204
BL101
BPF002
TH101
BPF001
IC5
IC10
FL3
FL2
C230
C229
C244

- BA BOARD -

-CONDUCTOR SIDE-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C
D
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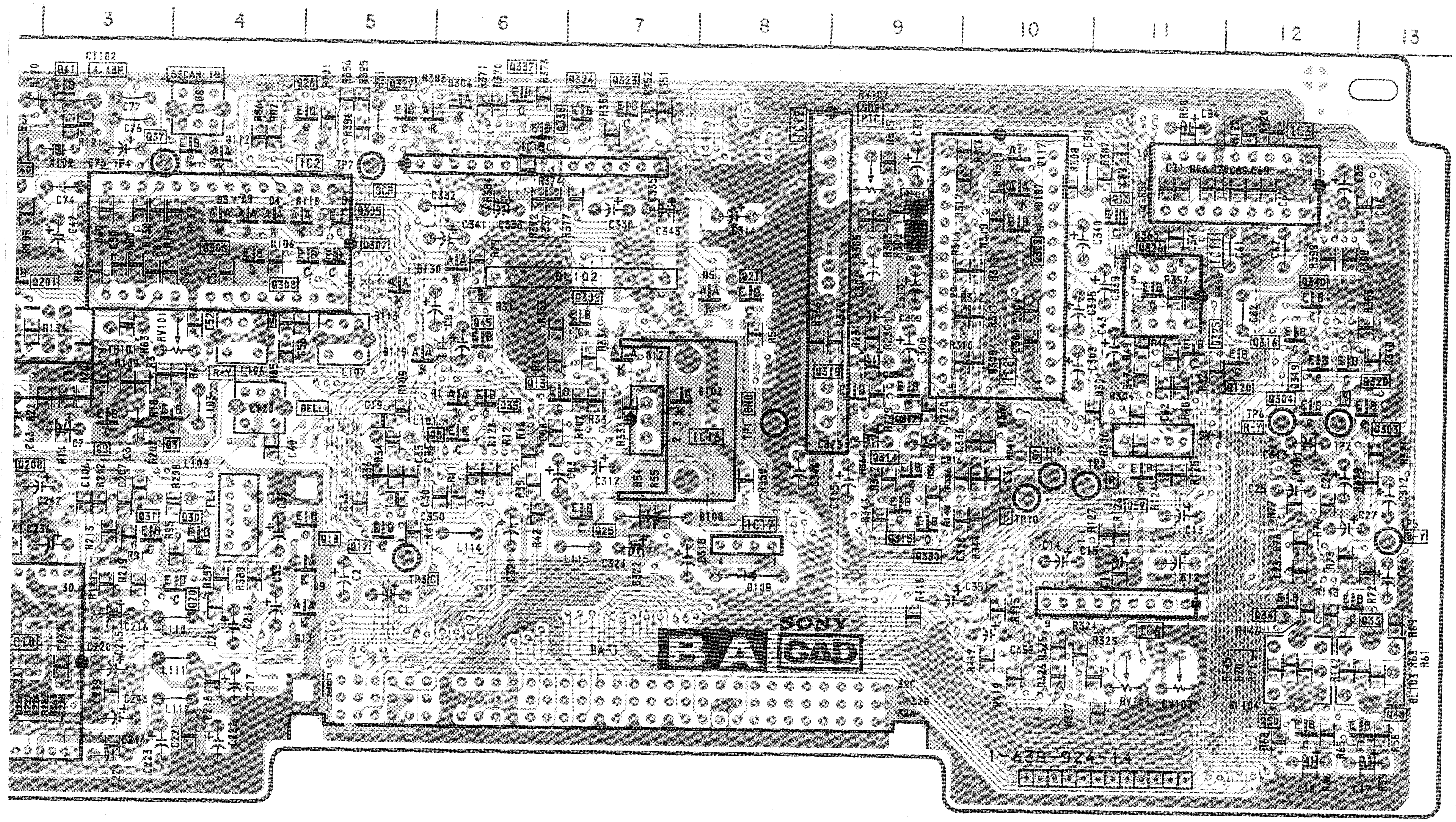
F
CT101 3.38M
CT102 4.43M
SECAM ID
RV105
X101
X102
IC2
TP7
SCP
BL101
BPF002
BPF001
TH101
RV101
BELL
IC15
BL102
IC16
IC17
IC10
RV102
SUB PIC
IC3
IC11
IC6
TP8
TP9
TP10
RV104
RV103
BL104
SONY
BA
CAD
BA-1
1-639-924-14


3
4
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6
7
8
9
10
11
12
13
IC2
IC3
IC6
IC8
IC10
IC11
IC12
IC15
IC16
IC17
SECAM ID
BELL
SUB PIC
SONY
BA
CAD
BA-1
1-639-924-14

BA BOARD (CONDUCTOR SIDE)

IC	
IC2	B-4
IC3	A-12
IC6	E-11
IC8	C-10
IC10	E-2
IC11	B-11
IC12	A-8
IC15	A-6
IC16	D-7
IC17	D-8

TRANSISTOR	
Q3	C-3
Q8	D-6
Q9	C-3
Q10	D-2
Q11	C-2
Q13	C-6
Q15	B-11
Q17	D-5
Q18	D-5
Q20	E-4
Q21	B-8
Q25	D-7
Q26	A-5
Q30	D-4
Q31	D-3
Q33	E-13
Q34	E-12
Q35	C-6
Q37	A-4
Q38	A-2
Q39	A-2
Q40	A-2
Q41	A-3
Q45	C-6
Q48	F-13
Q50	F-12
Q52	D-11
Q120	C-12
Q201	B-2
Q202	B-1
Q203	A-1
Q204	B-2
Q208	D-2
Q209	F-2
Q210	F-1
Q212	E-2
Q213	E-2
Q301	B-9
Q302	B-10
Q303	C-13
Q304	C-12
Q305	B-5
Q306	B-4
Q307	B-5
Q308	B-5
Q309	C-7
Q314	D-9
Q315	D-9
Q316	C-12
Q317	C-9
Q318	C-9
Q319	C-12
Q320	C-13
Q323	A-7
Q324	A-7
Q325	C-11
Q326	B-11
Q327	A-5
Q330	D-9
Q337	A-6
Q338	A-6
Q340	B-12
Q350	D-2

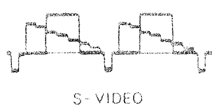
DIODE	
D1	C-6
D3	B-4
D4	B-4
D5	B-8
D8	B-4
D9	E-5
D11	E-5
D12	C-7
D102	C-7
D107	B-10
D108	D-7
D109	D-8
D112	A-4
D113	B-5
D117	A-10
D118	B-5
D119	C-5
D130	B-5
D303	A-5
D304	A-6

VARIABLE RESISTOR	
CT101	A-2
CT102	A-3
RV101	C-3
RV102	A-9
RV103	E-11
RV104	E-11
RV105	B-2

- ░ : Pattern from the side which enables seeing.
- ▒ : Pattern of the rear side.

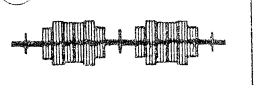
BB BOARD (1/2)

①



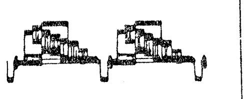
S-VIDEO
0.9Vp-p (H)

②



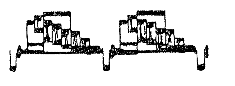
S-VIDEO
0.5Vp-p (H)

③



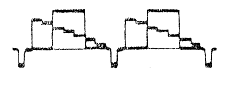
1Vp-p (H)

④



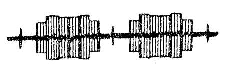
1Vp-p (H)

⑤



S-VIDEO
1Vp-p (H)

⑥



S-VIDEO
0.32Vp-p (H)

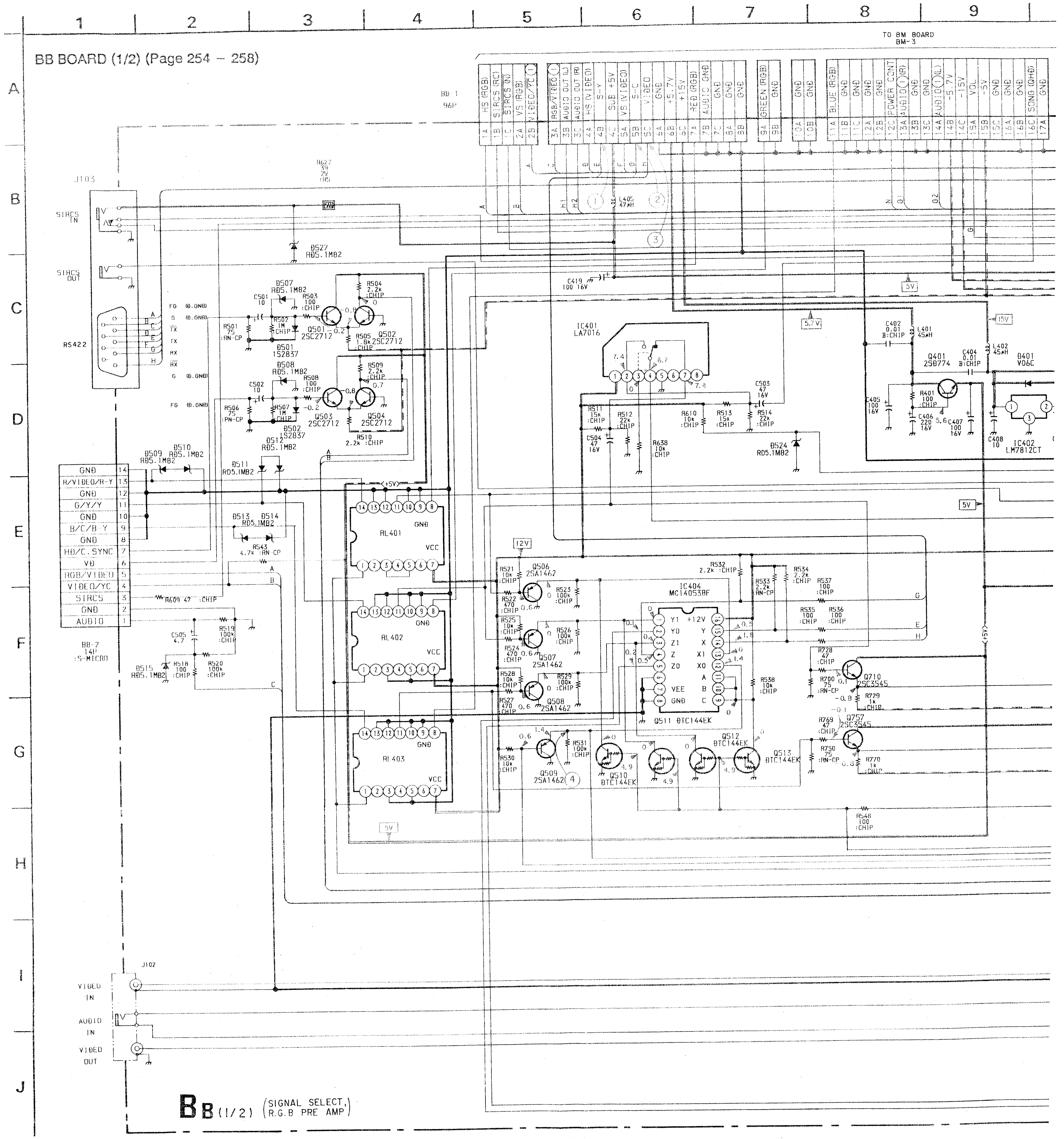
BB (1/2)	IC401	LA7016	SYNC. SW-1	531	DTC144EK	MODE SW-12
	402	LM7812CT	+12V REG	532	2SC2712	AUDIO AMP-4
	403	LM7912CT	-12V REG	533	2SC2712	AUDIO BUFF-3
	404	MC14053BF	SIG. SW	534	2SD789	MODE SW-13
	405	SN74HC157ANS	MODE SW-1	535	DTC144EK	MODE SW-14
	407	SN74HC157ANS	SYNC SW-2	536	DTC144EK	MODE SW-15
	408	HD14053BFP	MODE SW-2	537	DTC144EK	MODE SW-16
	409	HD14053BFP	MODE SW-3	538	DTC144EK	MODE SW-17
	412	μPC1406HA	AUDIO ATT.	540	DTC144EK	MODE SW-18
	422	μPC393G2	MODE ENCODER-1	545	2SA1162	MODE SW-23
	423	SN74HC32ANS	MODE ENCODER-2	546	DTC144EK	MODE SW-24
	424	μPC393G2	MODE ENCODER-3	548	DTC144EK	MODE SW-26
				549	DTC144EK	MODE SW-27
	Q401	2SD774	+5REG.	550	DTC144EK	MODE SW-28
	402	2SB734	–5REG.	551	DTC144EK	MODE SW-29
	403	DTC144EK	POWER CONT-1	552	DTC144EK	MODE SW-30
	404	2SC2712	POWER CONT-2	553	2SC2712	AUDIO BUFF-2
	405	DTC144EK	POWER CONT-3	710	2SC3545	G BUFF-5
	450	2SC2712	SIRCS SW-1	741	DTC144EK	MODE SW-31
	451	2SC2712	SIRCS SW-2	757	2SC3545	B BUFF-7
	452	2SC2712	SIRCS SW-3	800	2SC2785-HFE	
	453	DTC144EK	SIRCS SW-4			
	454	DTC144EK	SIRCS SW-5	D401	V06C	+12V PROT
	456	2SC2712	SIRCS SW-6	402	V06C	–12V PROT
	457	2SA1162	SIRCS SW-7	450	1S2837	SIRCS OR
	501	2SC2712	H.SYNC SW-1	451	1S2837	AUDIO PROT-1
	502	2SC2712	H.SYNC SW-2	452	RD2.4ES-B1	LEBEL SHIFT
	503	2SC2712	V.SYNC SW-1	501	1S2837	H.SYNC CLAMP
	504	2SC2712	V.SYNC SW-2	502	1S2837	V.SYNC CLAMP
	506	2SA1462	R BUFF.	503	1S2837	VOLTAGE PROT.
	507	2SA1462	G BUFF.	504	RD5.1M-B2	AUDIO PROT-2
	508	2SA1462	B BUFF.	506	RD5.1M-B2	POW CONT.
	509	2SA1462	VIDEO BUFF.	507	RD5.1M-B2	H.SYNC PROT
	510	DTC144EK	MODE SW-1	508	RD5.1M-B2	V.SYNC PROT
	511	DTC144EK	MODE SW-2	509	RD5.1M-B2	R PROT-1
	512	DTC144EK	MODE SW-3	510	RD5.1M-B2	R PROT-2
	513	DTC144EK	MODE SW-4	511	RD5.1M-B2	G PROT-1
	514	DTC144EK	MODE SW-5	512	RD5.1M-B2	G PROT-2
	515	2SC2712	MODE SW-6	513	RD5.1M-B2	B PROT-1
	516	2SA1462	Y BUFF-1	514	RD5.1M-B2	B PROT-2
	517	2SA1462	C BUFF-1	515	RD5.1M-B2	AUDIO PROT-4
	518	2SC2712	AUDIO BUFF-1	516	RD13M-B2	Y PROT.
	519	2SC2712	AUDIO BUFF-2	518	RD13M-B2	C PROT.
	520	DTC144EK	MODE SW-7	520	RD5.1M-B2	S SW PROT-1
	521	DTC144EK	MODE SW-8	521	RD5.1M-B2	S SW PROT-2
	522	2SC2712	VIDEO AMP-1	522	RD13M-B2	VIDEO PROT-1
	523	2SC2712	VIDEO AMP-2	523	RD13M-B2	VIDEO PROT-2
	524	2SC2712	VIDEO BUFF-2	524	RD5.1M-B2	HD SEL PROT.
	525	2SC2712	AUDIO AMP-1	525	RD2.4ES-B1	LEBEL SHIFT
	526	2SC2712	AUDIO AMP-2	526	1S2837	MODE SW-1
	527	2SC2712	AUDIO AMP-3	527	RD5.1M-B2	SUB5V PROT
	528	DTC144EK	MODE SW-9	528	1S2837	MODE SW-2
	529	DTC144EK	MODE SW-10	529	RD3.3ES-B1	LEBEL SHIFT
	530	DTC144EK	MODE SW-11	530	1S2837	AUDIO MUTE

BB BOARD (1/2)

REF.	Pin No	NTSC 3.58	S-VIDEO
IC404	②	0.1	1.6
	④	0.5	1.4
	⑤	0.1	1.4
	⑫	1.4	0.1
	⑭	1.8	0.5
	⑮	0.5	2
IC405	⑥	4.5	0
	⑦	4.8	0
IC408	③	4.5	0
	④	4.5	0
	⑩	4.6	4.8
	⑪	4.5	4.6
IC423	②	4.9	0

REF.		NTSC 3.58	S-VIDEO
Q509	B	0.6	0.6
	C	–	–
	E	1.4	0
Q516	B	0.6	0.6
	C	0.1	1.6
	E	–	–
Q517	B	0.6	0.6
	C	0.1	1.4
	E	–	–
Q528	B	4.9	0
	C	0	4.1
	E	–	–
Q529	B	0	1.4
	C	4.1	0
	E	–	–
Q530	B	4.9	0
	C	0.1	1.6
	E	–	–
Q531	B	4.9	0
	C	0.1	1.4
	E	–	–

BB BOARD (1/2) (Page 254 – 258)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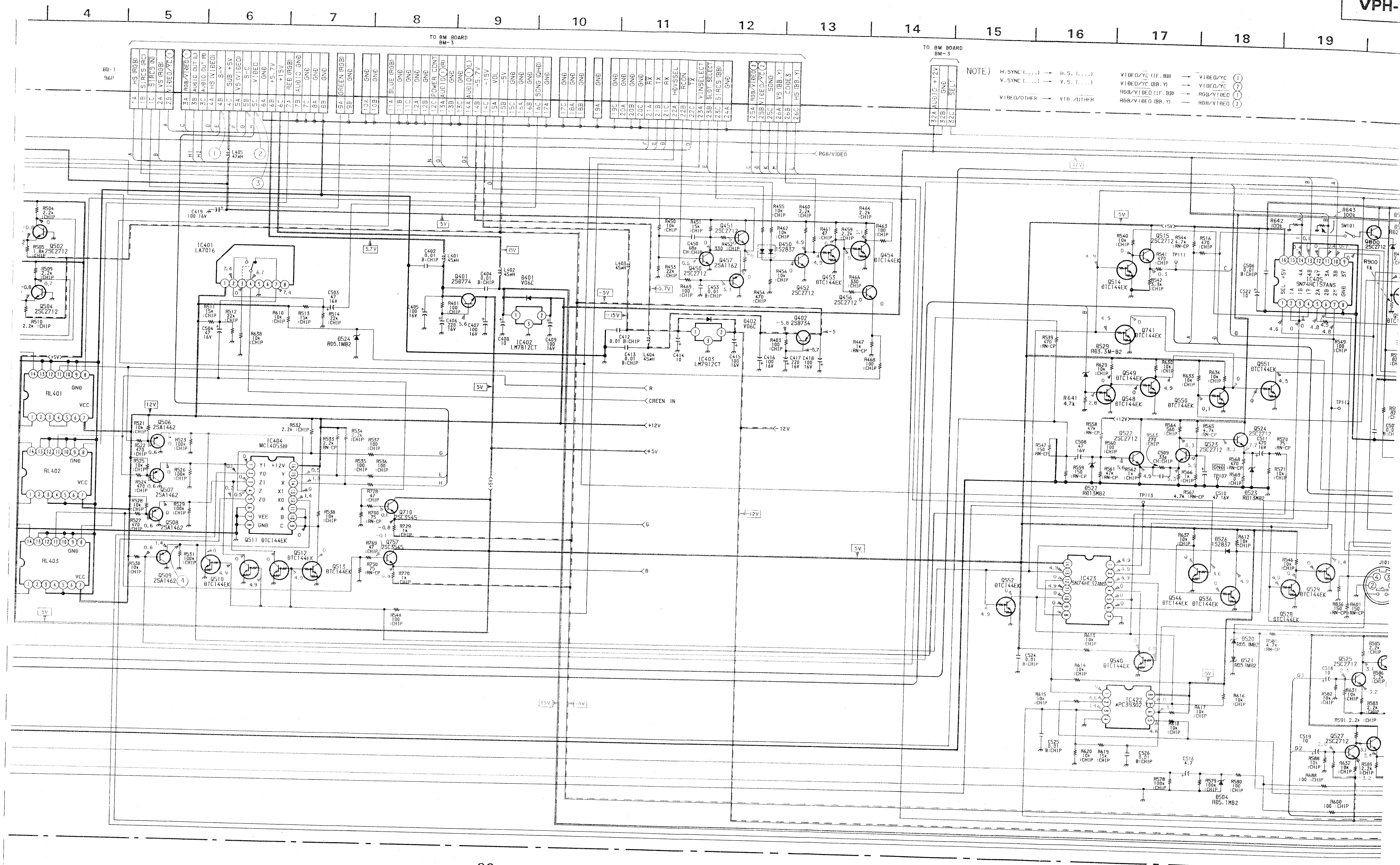
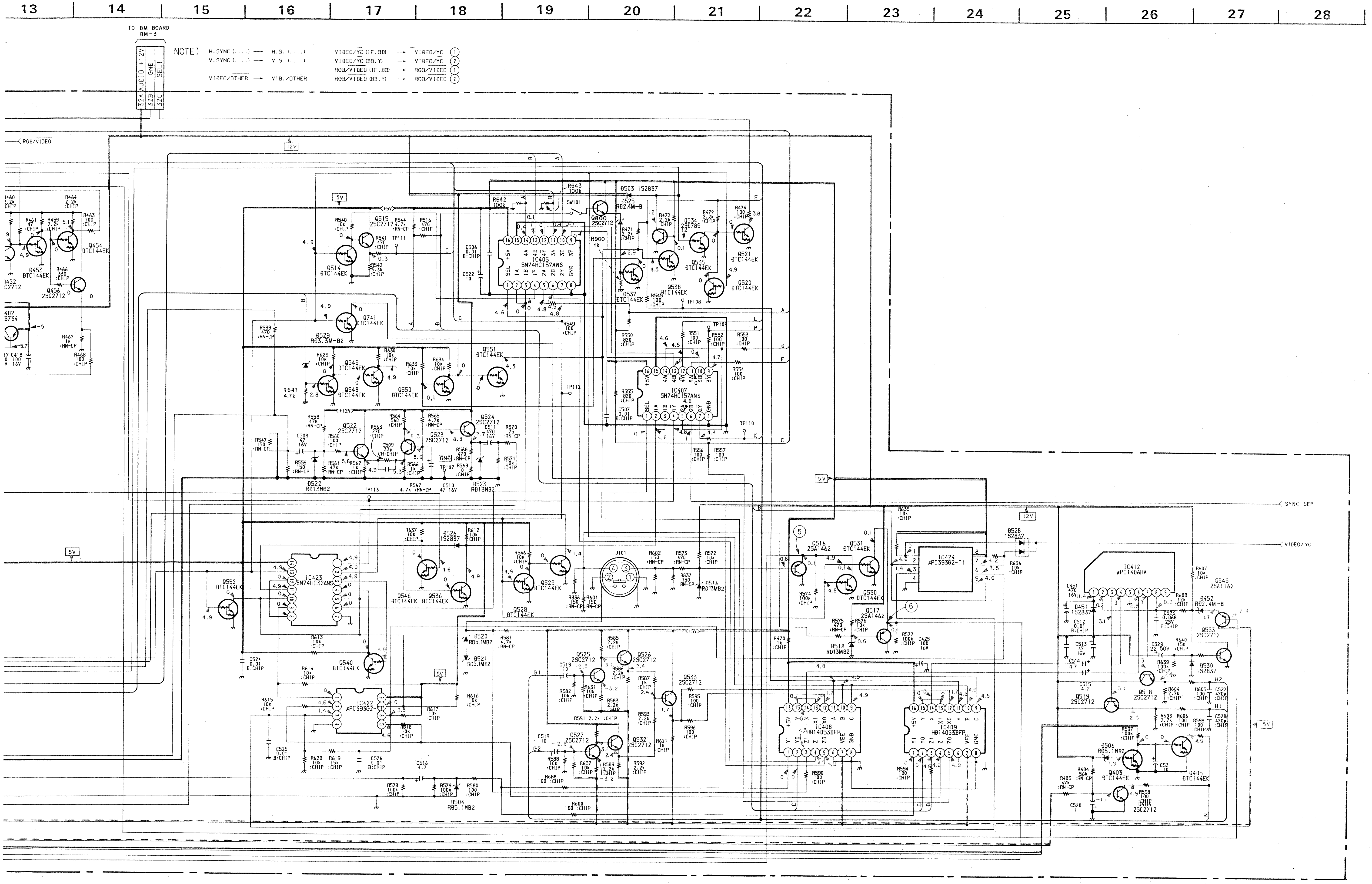
F
G
H
I
J
TO BM BOARD BM-3
J103
SIRCS IN
SIRCS OUT
RS422
IC401 LA7016
Q401 2SD774
D401 V06C
IC402 LM7812CT
RL401
RL402
RL403
IC404 MC14053BF
Q501 2SC2712
Q502 2SC2712
Q503 2SC2712
Q504 2SC2712
Q506 2SA1462
Q507 2SA1462
Q508 2SA1462
Q509 2SA1462
Q510 DTC144EK
Q511 DTC144EK
Q512 DTC144EK
Q513 DTC144EK
Q710 2SC3545
Q757 2SC3545
BB-7 14P :S-MICRO
GND
R/VIDEO/R-Y
G/Y/Y
B/C/B-Y
HD/C.SYNC
VD
RGB/VIDEO
VIDEO/YC
SIRCS
AUDIO
J102
VIDEO IN
AUDIO IN
VIDEO OUT
5V
12V

BB (1/2) (SIGNAL SELECT, R.G.B PRE AMP)


4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
TO BM BOARD BM-3
BB-1 96P
HS (RGB)
S.TRCS (RC)
S.TRCS (N)
VS (RGB)
VIDEO/YC (1)
RGB/VIDEO (1)
AUDIO OUT (L)
AUDIO OUT (R)
HS (VIDEO)
S-Y
SUB +5V
VS (VIDEO)
S-C
VIDEO
GND
+5.7V
+15V
RED (RGB)
AUDIO GND
GREEN (RGB)
BLUE (RGB)
POWER CONT
AUDIO (1)(R)
AUDIO (1)(L)
-5.7V
-15V
VOL
-5V
SONG (QHD)
RX
TX
+B/VSSEL
RCON
V.IN SELECT
SLOT SELECT
S.TRCS (BB)
RGB/VIDEO (2)
VIDEO/YC (2)
SONG
VS (BB.Y)
CODE3
HS (BB.Y)
AUDIO +12V
SEL1
NOTE)
H.SYNC (....) → H.S. (....)
V.SYNC (....) → V.S. (....)
VIDEO/OTHER → VID./OTHER
VIDEO/YC (IF.BB) → VIDEO/YC ①
VIDEO/YC (BB.Y) → VIDEO/YC ②
RGB/VIDEO (IF.BB) → RGB/VIDEO ①
RGB/VIDEO (BB.Y) → RGB/VIDEO ②
RGB/VIDEO
L405 47μH
IC401 LA7016
IC402 LM7812CT
IC403 LM7912CT
IC404 MC14053BF
IC405 SN74HC157ANS
IC422 μPC393G2
IC423 SN74HC32ANS
Q401 2SB774
Q402 2SB734
D401 V06C
D402 V06C
D524 RD5.1MB2
Q450 2SC2712
Q451 2SC2712
Q452 2SC2712
Q453 DTC144EK
Q454 DTC144EK
Q456 2SC2712
Q457 2SA1162
D450 1S2837
Q502 2SC2712
Q504 2SC2712
Q506 2SA1462
Q507 2SA1462
Q508 2SA1462
Q509 2SA1462
Q510 DTC144EK
Q511 DTC144EK
Q512 DTC144EK
Q513 DTC144EK
Q710 2SC3545
Q757 2SC3545
Q514 DTC144EK
Q515 2SC2712
Q741 DTC144EK
Q548 DTC144EK
Q549 DTC144EK
Q550 DTC144EK
Q551 DTC144EK
Q522 2SC2712
Q523 2SC2712
Q524 2SC2712
D522 RD13MB2
D523 RD13MB2
D529 RD3.3M-B2
Q540 DTC144EK
Q544 DTC144EK
Q536 DTC144EK
Q552 DTC144EK
Q528 DTC144EK
Q529 DTC144EK
D526 1S2837
D520 RD5.1MB2
D521 RD5.1MB2
Q525 2SC2712
Q527 2SC2712
D504 RD5.1MB2
Q800 2SC2712
SW101
RL401
RL402
RL403
GND
VCC
TP111
TP112
TP113
TP107
J101
R
GREEN IN
G
B
E
H
+12V
+5V
12V
5V
15V
-5V
-15V
-12V
5.7V
-5.7V
(+5V)
(+12V)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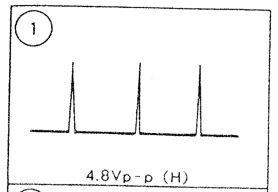
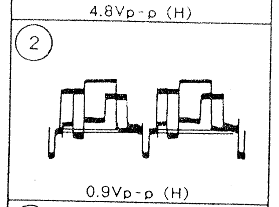
28
TO BM BOARD BM-3
AUDIO +12V
GND
SEL1
32A
32B
32C
RGB/VIDEO
12V
5V
IC405 SN74HC157ANS
IC407 SN74HC157ANS
IC423 SN74HC32ANS
IC422 μPC39362-T1
IC424 μPC39362-T1
IC408 HD14053BFP
IC409 HD14053BFP
IC412 μPC1406HA
J101
SW101
Q800 2SC2712
D503 1S2837
D525 RD2.4M-B
Q515 2SC2712
Q514 DTC144EK
Q741 DTC144EK
D529 RD3.3M-B2
Q549 DTC144EK
Q548 DTC144EK
Q550 DTC144EK
Q551 DTC144EK
Q522 2SC2712
Q523 2SC2712
Q524 2SC2712
D522 RD13MB2
D523 RD13MB2
Q537 DTC144EK
Q538 DTC144EK
Q534 2SB789
Q535 DTC144EK
Q521 DTC144EK
Q520 DTC144EK
Q453 DTC144EK
Q454 DTC144EK
Q456 2SC2712
Q552 DTC144EK
Q546 DTC144EK
Q536 DTC144EK
D526 1S2837
Q540 DTC144EK
Q529 DTC144EK
Q528 DTC144EK
D516 RD13MB2
D520 RD5.1MB2
D521 RD5.1MB2
D504 RD5.1MB2
Q525 2SC2712
Q526 2SC2712
Q533 2SC2712
Q527 2SC2712
Q532 2SC2712
Q516 2SA1462
Q531 DTC144EK
Q530 DTC144EK
Q517 2SA1462
D518 RD13MB2
D528 1S2837
SYNC SEP
VIDEO/YC
Q545 2SA1162
D452 RD2.4M-B
Q553 2SC2712
D451 1S2837
D530 1S2837
Q518 2SC2712
Q519 2SC2712
D506 RD5.1MB2
Q403 DTC144EK
Q405 DTC144EK
Q404 2SC2712
TP107
TP108
TP109
TP110
TP111
TP112
TP113
-5V

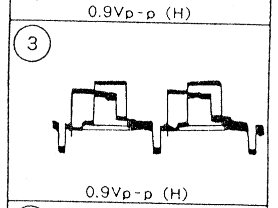
NOTE) H.SYNC (....) → H.S. (....)
V.SYNC (....) → V.S. (....)
VIDEO/$\overline{\text{OTHER}}$ → VID./$\overline{\text{OTHER}}$

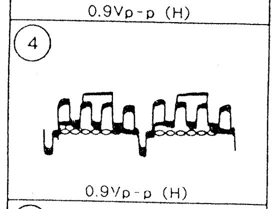
VIDEO/$\overline{\text{YC}}$ (IF.BB) → $\overline{\text{VIDEO}}$/YC ①
VIDEO/$\overline{\text{YC}}$ (BB.Y) → VIDEO/$\overline{\text{YC}}$ ②
RGB/$\overline{\text{VIDEO}}$ (IF.BB) → RGB/$\overline{\text{VIDEO}}$ ①
RGB/$\overline{\text{VIDEO}}$ (BB.Y) → RGB/$\overline{\text{VIDEO}}$ ②

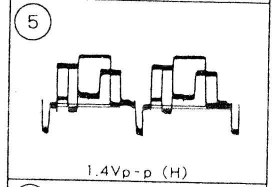
BB BOARD (2/2)

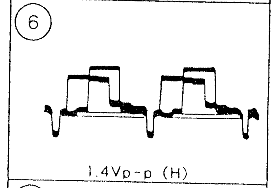

① 4.8Vp-p (H)

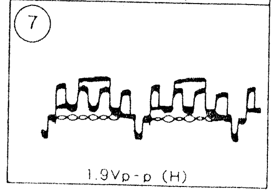

② 0.9Vp-p (H)


③ 0.9Vp-p (H)


④ 0.9Vp-p (H)


⑤ 1.4Vp-p (H)


⑥ 1.4Vp-p (H)


⑦ 1.9Vp-p (H)

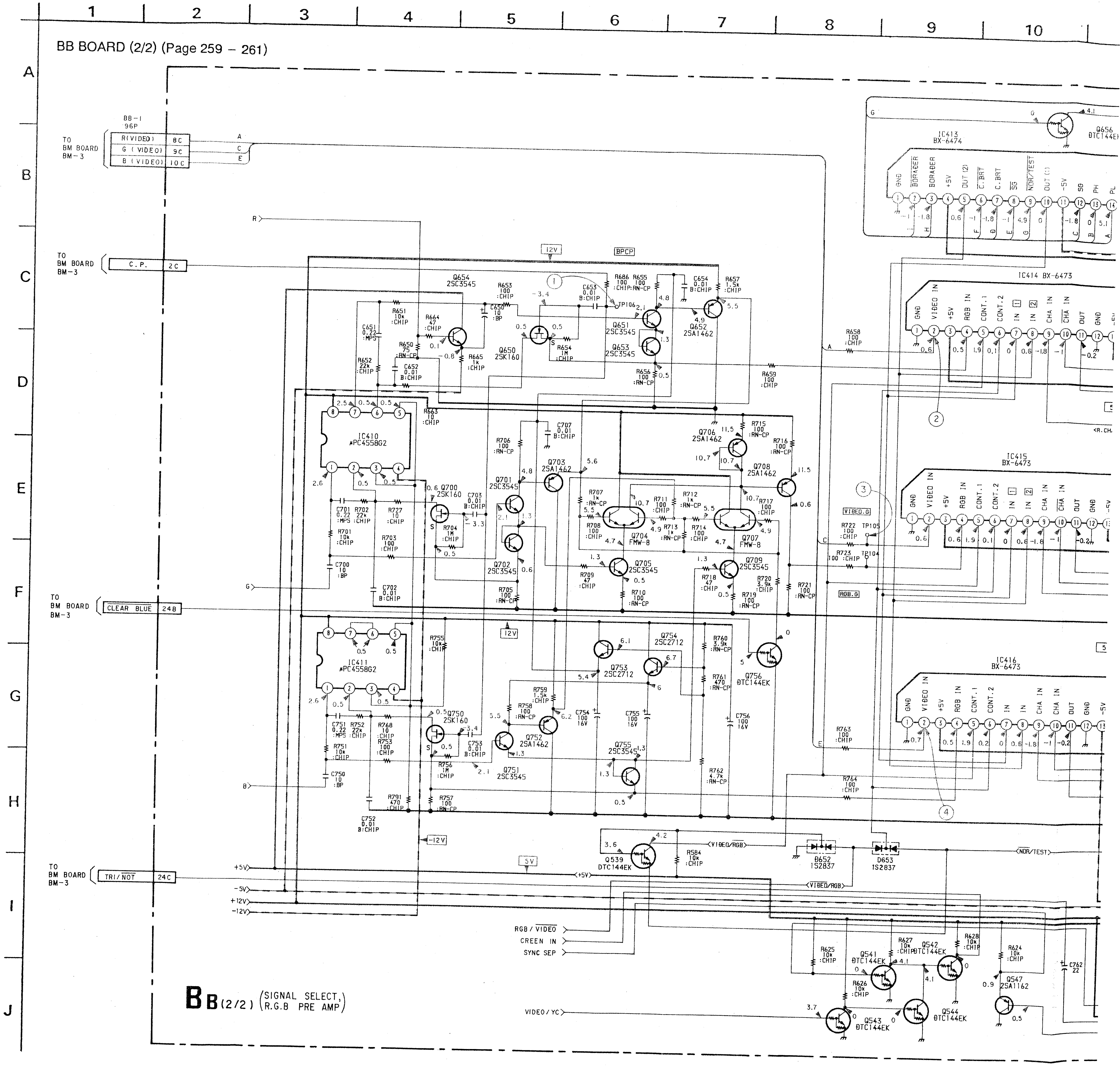
BB (2/2)	IC410	μPC4558G2	SIG. CLAMP-1
	411	μPC4558G2	SIG. CLAMP-2
	413	BX-6474	TEST SIG. GEN.
	414	BX-6473	R SIG. SW
	415	BX-6473	G SIG. SW
	416	BX-6473	B SIG. SW
	417	BX-7913	S ON G SYNC SEP.
	418	BX-6475	R AMP.
	419	BX-6475	G AMP.
	420	BX-6475	B AMP.
	Q539	DTC144EK	MODE SW-17
	541	DTC144EK	MODE SW-19
	542	DTC144EK	MODE SW-20
	543	DTC144EK	MODE SW-21
	544	DTC144EK	MODE SW-22
	547	2SA1162	MODE SW-25
	650	2SK160	R CLAMP
	651	2SC3545	R BUFF-1
	652	2SA1462	R BUFF-2
	653	2SC3545	R BUFF-3
	654	2SC3545	R BUFF-4
	656	DTC144EK	MODE SW-31
	700	2SK160	G CLAMP
	701	2SC3545	G BUFF-1
	702	2SC3545	G BUFF-2
	703	2SA1462	G BUFF-3
	704	FMW-8	CB SW-1
	705	2SC3545	CB SW-2
	706	2SA1462	CB SW-3
	707	FMW-8	CB SW-4
	708	2SA1462	G BUFF-4
	709	2SC3545	CB SW-5
	750	2SK160	B CLAMP
	751	2SC3545	B BUFF-1
	752	2SA1462	B BUFF-2
	753	2SC2712	B BUFF-3
	754	2SC2712	B BUFF-4
	755	2SC3545	B BUFF-5
	756	DTC144EK	B BUFF-6
	D634	1S2837	MODE OR-1
	652	1S2837	MODE OR-2
	653	1S2837	MODE OR-3

BB BOARD (2/2)

REF.	Pin No.	NTSC 3.58	S-VIDEO
IC414	②	0.6	3.1
	⑪	-0.2	2.2
IC415	②	0.6	3.1
	⑪	-0.2	2.2
IC416	②	0.7	3.1
	⑪	-0.2	2.3

REF.		NTSC 3.58	S-VIDEO
Q539	B	3.6	2.4
	C	4.2	1.9
	E	–	–
Q656	B	0	4.9
	C	4.1	0
	E	–	–

BB BOARD (2/2) (Page 259 – 261)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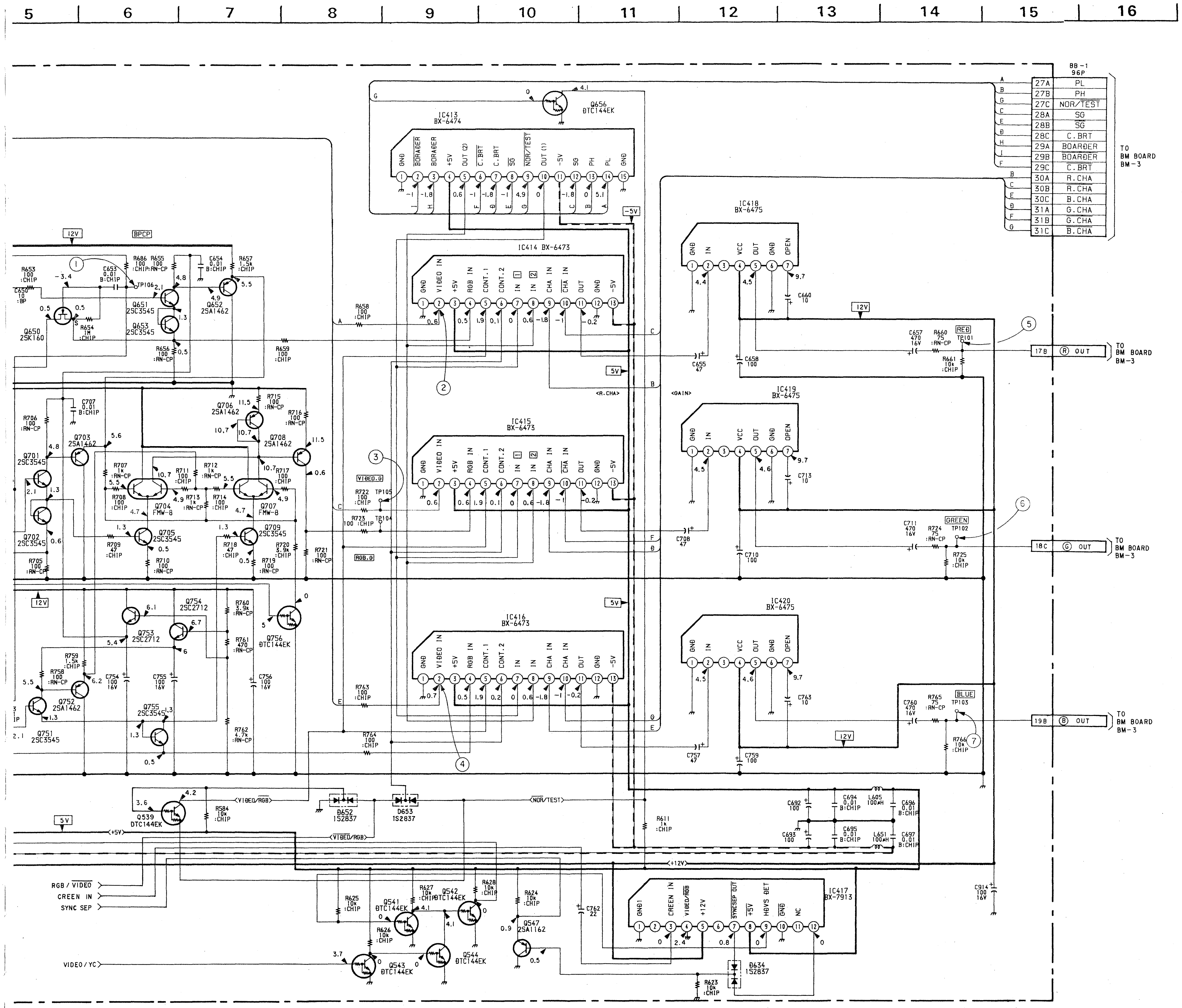
J
TO BM BOARD BM-3
BB-I 96P
R(VIDEO) 8C
G(VIDEO) 9C
B(VIDEO) 10C
C.P. 2C
CLEAR BLUE 24B
TRI/NOT 24C
IC410 μPC4558G2
IC411 μPC4558G2
IC413 BX-6474
IC414 BX-6473
IC415 BX-6473
IC416 BX-6473
Q654 2SC3545
Q650 2SK160
Q651 2SC3545
Q652 2SA1462
Q653 2SC3545
Q656 DTC144EK
Q700 2SK160
Q701 2SC3545
Q702 2SC3545
Q703 2SA1462
Q704 FMW-8
Q705 2SC3545
Q706 2SA1462
Q707 FMW-8
Q708 2SA1462
Q709 2SC3545
Q750 2SK160
Q751 2SC3545
Q752 2SA1462
Q753 2SC2712
Q754 2SC2712
Q755 2SC3545
Q756 DTC144EK
Q539 DTC144EK
Q541 DTC144EK
Q542 DTC144EK
Q543 DTC144EK
Q544 DTC144EK
Q547 2SA1162
D652 1S2837
D653 1S2837
12V
BPCP
5V
+5V
-5V
+12V
-12V
VIDEO/RGB
NOR/TEST
RGB/VIDEO
CREEN IN
SYNC SEP
VIDEO/YC
TP104
TP105
TP106
VIDEO.G
RGB.G

BB (2/2) (SIGNAL SELECT, R.G.B PRE AMP)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14
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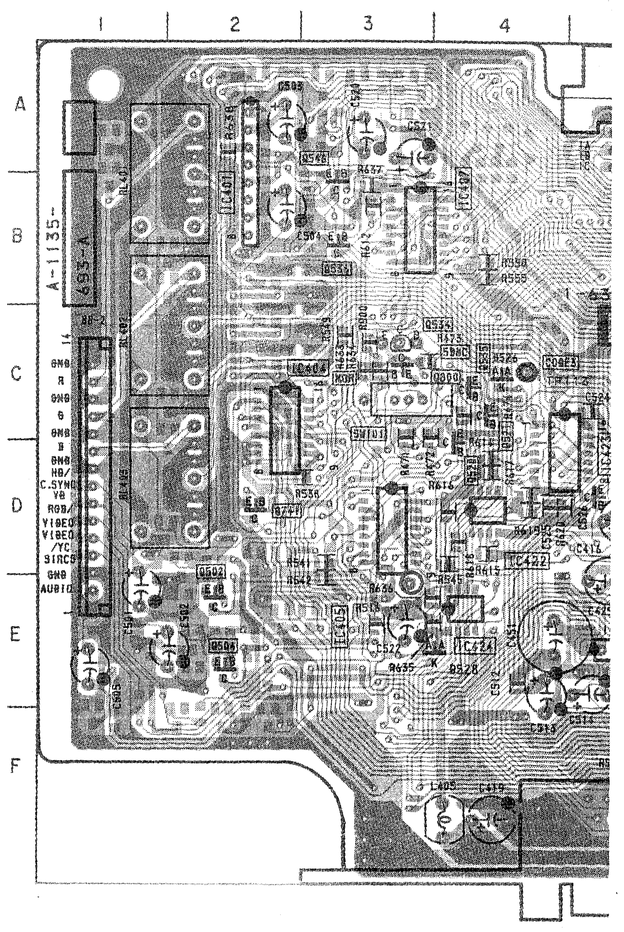
16
IC413 BX-6474
Q656 DTC144EK
GND
BORADER
BORADER
+5V
OUT (2)
C.BRT
C.BRT
SG
NOR/TEST
OUT (1)
-5V
SG
PH
PL
GND
BB-1 96P
27A PL
27B PH
27C NOR/TEST
28A SG
28B SG
28C C.BRT
29A BOARDER
29B BOARDER
29C C.BRT
30A R.CHA
30B R.CHA
30C B.CHA
31A G.CHA
31B G.CHA
31C B.CHA
TO BM BOARD BM-3
IC414 BX-6473
IC415 BX-6473
IC416 BX-6473
GND
VIDEO IN
+5V
RGB IN
CONT.1
CONT.2
IN 1
IN 2
CHA IN
CHA IN
OUT
GND
-5V
IC418 BX-6475
IC419 BX-6475
IC420 BX-6475
GND
IN
VCC
OUT
GND
OPEN
12V
5V
-5V
BPCP
RED
GREEN
BLUE
17B R OUT
18C G OUT
19B B OUT
TO BM BOARD BM-3
<R.CHA>
<GAIN>
VIDEO.G
RGB.G
Q650 2SK160
Q651 2SC3545
Q652 2SA1462
Q653 2SC3545
Q701 2SC3545
Q702 2SC3545
Q703 2SA1462
Q704 FMW-8
Q705 2SC3545
Q706 2SA1462
Q707 FMW-8
Q708 2SA1462
Q709 2SC3545
Q751 2SC3545
Q752 2SA1462
Q753 2SC2712
Q754 2SC2712
Q755 2SC3545
Q756 DTC144EK
Q539 DTC144EK
D652 1S2837
D653 1S2837
<VIDEO/RGB>
<NOR/TEST>
<+5V>
<+12V>
L605 100µH
L651 100µH
R611 1k :CHIP
RGB / VIDEO
GREEN IN
SYNC SEP
VIDEO / YC
Q541 DTC144EK
Q542 DTC144EK
Q543 DTC144EK
Q544 DTC144EK
Q547 2SA1162
IC417 BX-7913
GND1
GREEN IN
VIDEO/RGB
+12V
SYNCSEP OUT
+5V
HDVS DET
GND
NC
D634 1S2837
R623 10k :CHIP
C914 100 16V

BB BOARD (COMPONENT SIDE)

IC	
IC401	B-2
IC402	A-12
IC403	C-6
IC404	C-2
IC405	D-3
IC407	B-3
IC408	E-5
IC409	E-8
IC410	D-8
IC411	D-8
IC412	E-5
IC413	B-10
IC414	C-12
IC415	D-12
IC416	E-11
IC417	F-12
IC418	B-12
IC419	C-12
IC420	D-12
IC422	D-4
IC423	D-5
IC424	E-4
TRANSISTOR	
Q401	A-10
Q402	D-6
Q502	E-2
Q504	E-2
Q517	F-8
Q520	D-4
Q521	C-4
Q522	F-9
Q534	C-3
Q535	C-4
Q536	B-3
Q541	E-10
Q542	E-10
Q543	E-9
Q544	E-9
Q545	E-7
Q546	A-3
Q552	D-5
Q701	D-9
Q702	D-8
Q703	D-9
Q704	C-9
Q707	C-9
Q741	D-2
Q751	D-8
Q800	C-4
DIODE	
D401	A-12
D402	C-6
D452	E-6
D523	E-9
D526	C-4
D528	E-4
D530	E-9

- BB BOARD - (COMPONENT SIDE) (Page 26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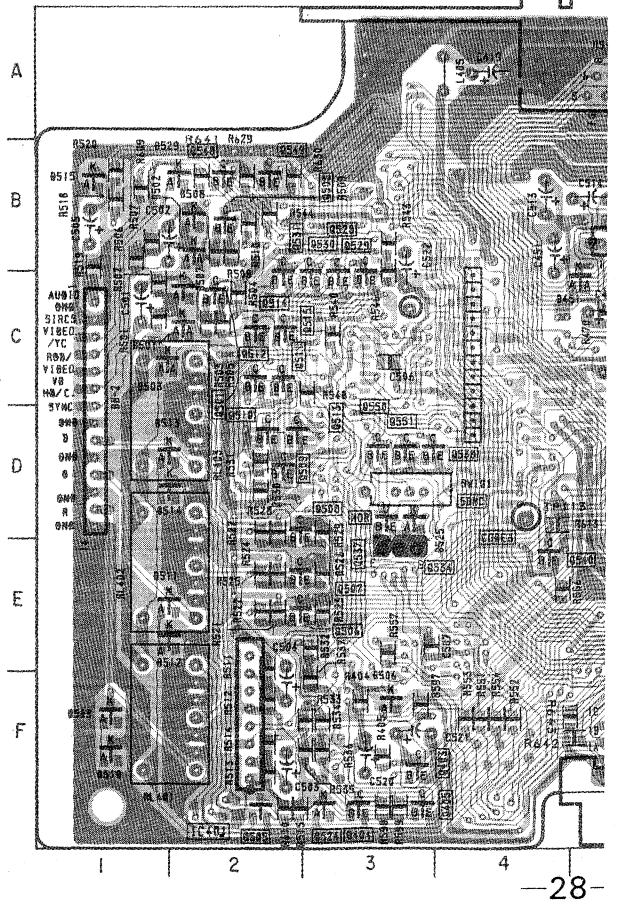
A-1135-693-A

(CONDUCTOR SIDE)


A
B
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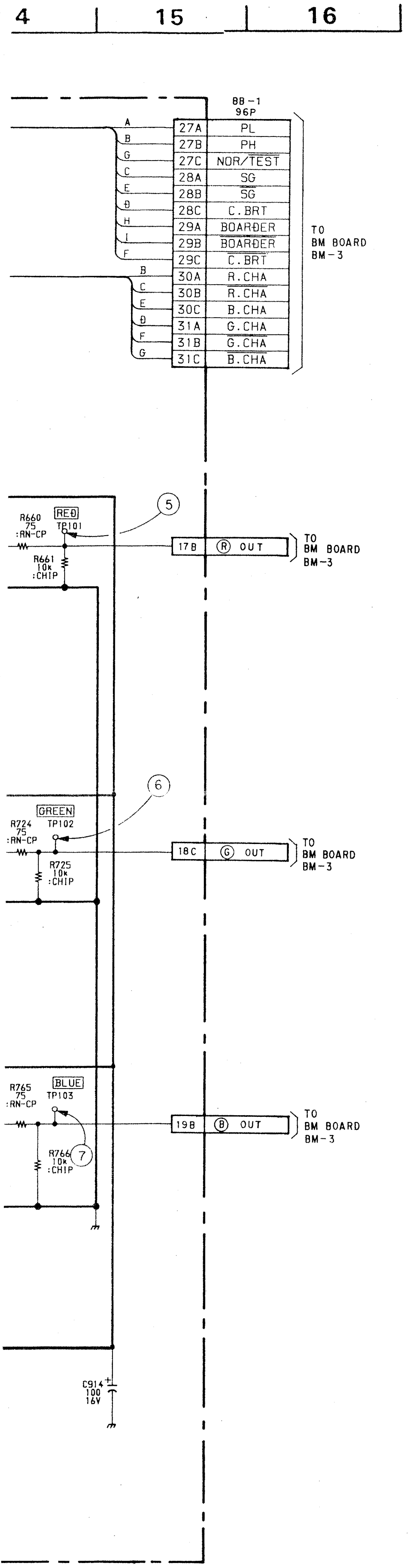
4


4
15
16
BB-1
96P
A
B
G
C
E
D
H
I
F
27A PL
27B PH
27C NOR/TEST
28A SG
28B SG
28C C.BRT
29A BOARDER
29B BOARDER
29C C.BRT
30A R.CHA
30B R.CHA
30C B.CHA
31A G.CHA
31B G.CHA
31C B.CHA
TO BM BOARD BM-3
R660 75 :RN-CP
RED
TP101
5
R661 10k :CHIP
17B Ⓡ OUT
TO BM BOARD BM-3
GREEN
R724 75 :RN-CP
TP102
6
R725 10k :CHIP
18C Ⓖ OUT
TO BM BOARD BM-3
BLUE
R765 75 :RN-CP
TP103
R766 10k :CHIP
7
19B Ⓑ OUT
TO BM BOARD BM-3
C914 100 16V

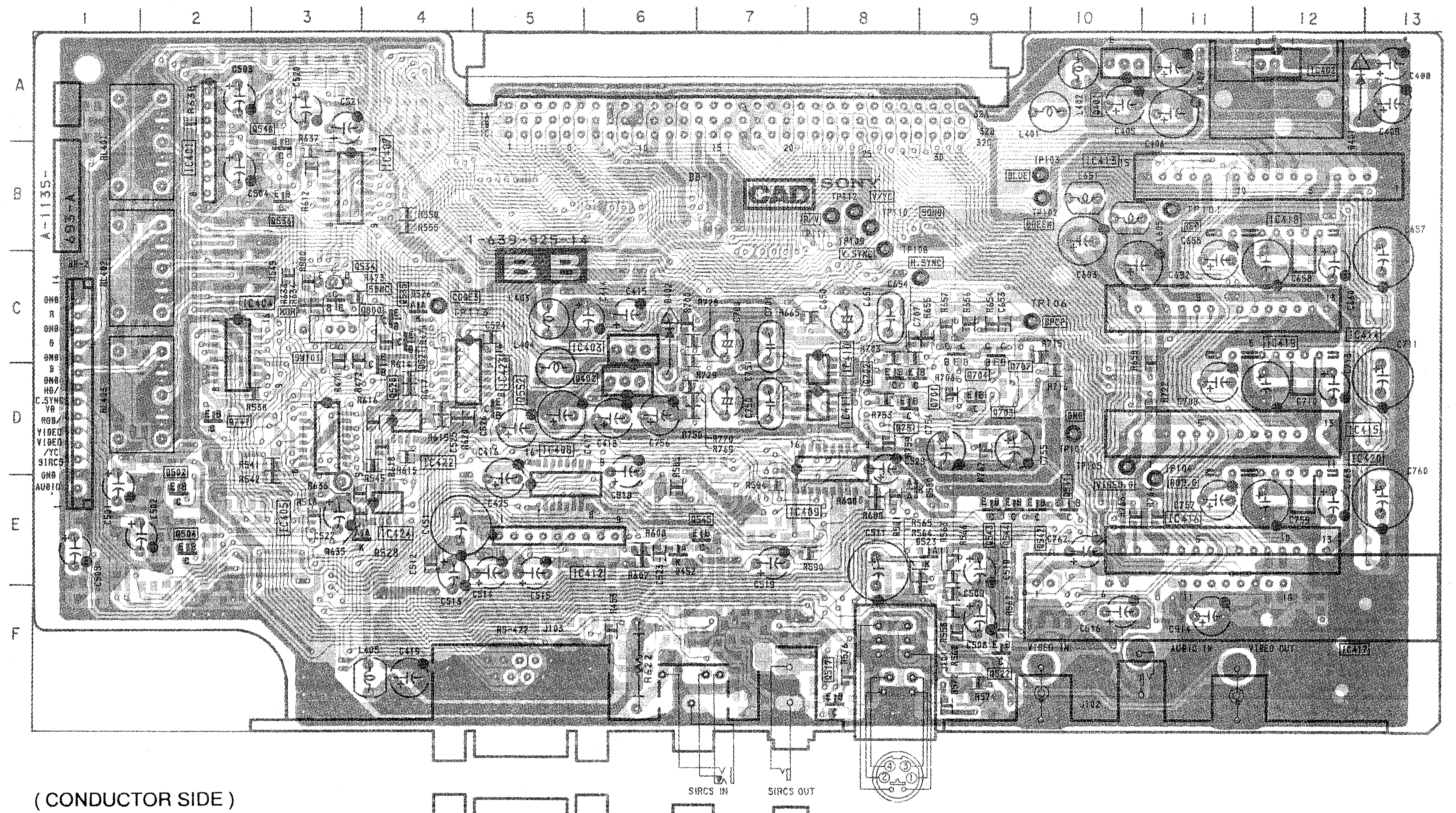
BB BOARD (COMPONENT SIDE)

IC	
IC401	B-2
IC402	A-12
IC403	C-6
IC404	C-2
IC405	D-3
IC407	B-3
IC408	E-5
IC409	E-8
IC410	D-8
IC411	D-8
IC412	E-5
IC413	B-10
IC414	C-12
IC415	D-12
IC416	E-11
IC417	F-12
IC418	B-12
IC419	C-12
IC420	D-12
IC422	D-4
IC423	D-5
IC424	E-4

TRANSISTOR	
Q401	A-10
Q402	D-6
Q502	E-2
Q504	E-2
Q517	F-8
Q520	D-4
Q521	C-4
Q522	F-9
Q534	C-3
Q535	C-4
Q536	B-3
Q541	E-10
Q542	E-10
Q543	E-9
Q544	E-9
Q545	E-7
Q546	A-3
Q552	D-5
Q701	D-9
Q702	D-8
Q703	D-9
Q704	C-9
Q707	C-9
Q741	D-2
Q751	D-8
Q800	C-4

DIODE	
D401	A-12
D402	C-6
D452	E-6
D523	E-9
D526	C-4
D528	E-4
D530	E-9

- BB BOARD - (COMPONENT SIDE) (Page 262, 263)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A
B
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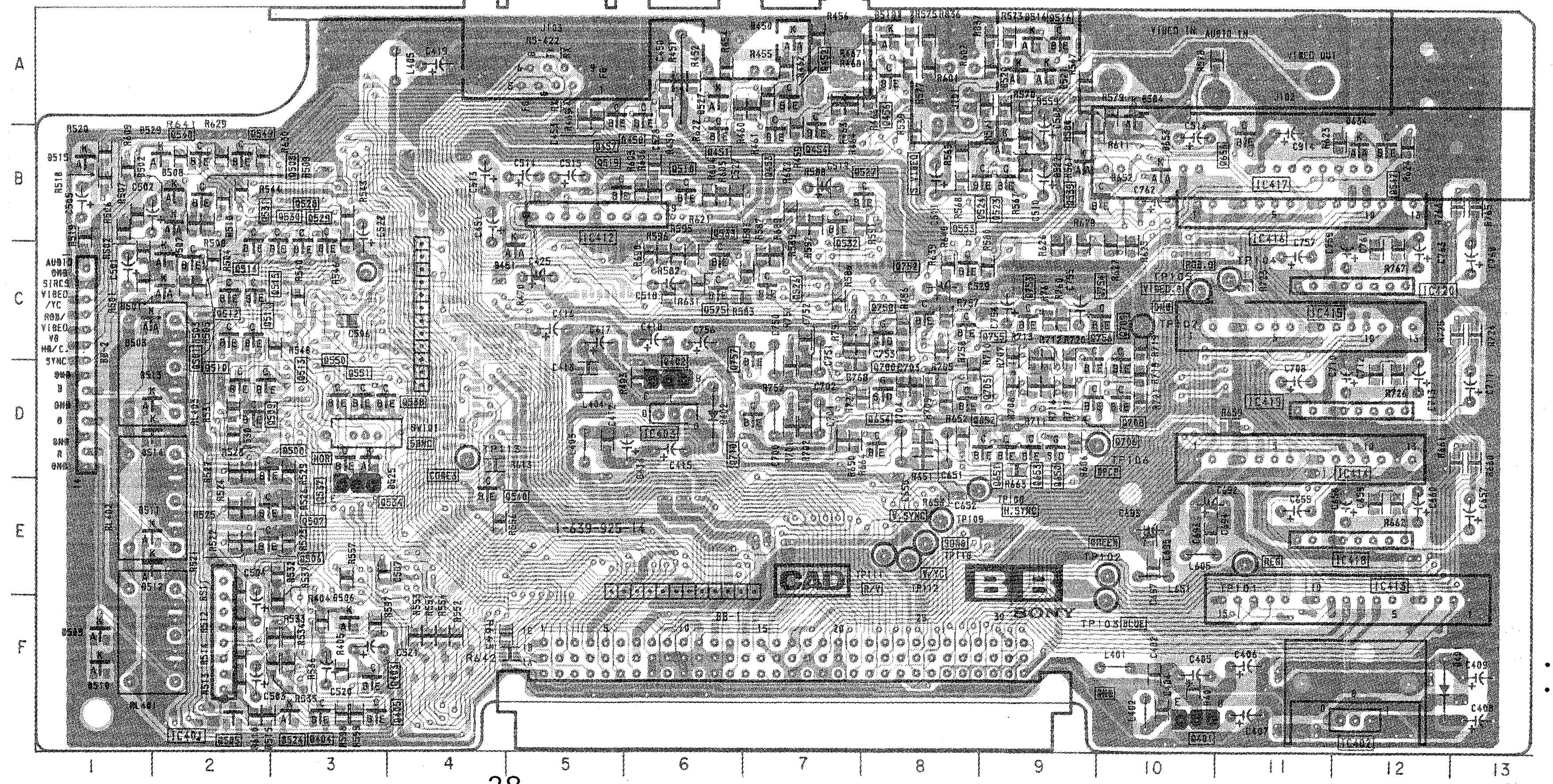
1-639-925-14
BB
CAD
SONY
A-1135-693-A
SIRCS IN
SIRCS OUT
VIDEO IN
AUDIO IN
VIDEO OUT

(CONDUCTOR SIDE)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13
A
B
C
D
E
F
1-639-925-14
CAD
BB
SONY
VIDEO IN
AUDIO IN
VIDEO OUT

BB BOARD (CONDUCTOR SIDE)

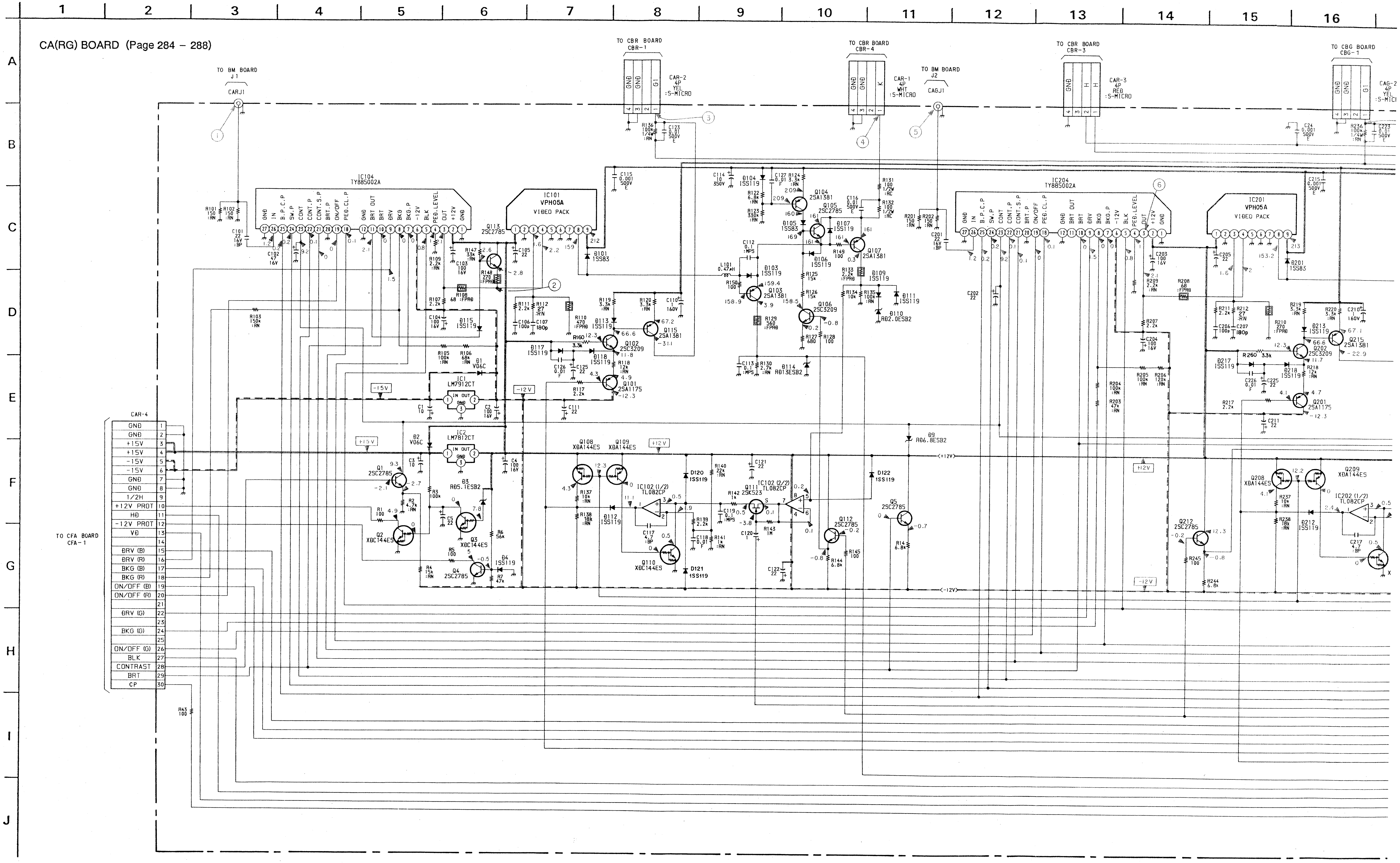
IC	
IC401	F-2
IC402	F-12
IC403	D-6
IC412	B-5
IC413	E-12
IC414	D-12
IC415	C-12
IC416	B-11
IC417	B-11
IC418	E-12
IC419	D-11
IC420	C-12

TRANSISTOR	
Q401	F-10
Q402	D-6
Q403	F-3
Q404	F-3
Q405	F-3
Q450	B-6
Q451	B-6
Q452	A-7
Q453	B-7
Q454	B-7
Q456	A-8
Q457	B-5
Q501	C-2
Q503	B-2
Q506	E-3
Q507	E-3
Q508	D-3
Q509	D-2
Q510	D-2
Q511	C-2
Q512	C-2
Q513	D-3
Q514	C-2
Q515	C-2
Q516	A-9
Q518	B-6
Q519	B-6
Q523	B-9
Q524	B-9
Q525	C-6
Q526	C-7
Q527	B-8
Q528	B-3
Q529	B-3
Q530	B-3
Q531	B-2
Q532	C-7
Q533	C-6
Q534	E-3
Q537	E-3
Q538	D-4
Q539	B-9
Q540	E-4
Q543	B-2
Q547	B-12
Q548	B-2
Q549	B-2
Q550	D-3
Q551	D-3
Q553	C-8
Q650	D-9
Q651	D-9
Q652	D-9
Q653	D-9
Q654	D-8
Q656	B-11
Q700	D-8
Q705	D-8
Q706	D-10
Q708	D-10
Q709	C-10
Q710	D-7
Q750	C-8
Q752	C-8
Q753	C-9
Q754	C-10
Q755	C-9
Q756	C-10
Q757	D-7

DIODE	
D401	F-13
D402	D-6
D450	A-7
D451	C-5
D501	C-2
D502	B-2
D503	C-1
D504	A-10
D506	F-3
D507	C-2
D508	B-2
D509	F-1
D510	F-1
D511	E-1
D512	E-1
D513	D-1
D514	D-1
D515	B-1
D516	A-9
D518	A-8
D520	A-9
D521	A-9
D522	B-9
D524	F-3
D525	D-3
D527	A-6
D529	B-2
D634	B-12
D652	B-10
D653	B-10

- ▨ : Pattern from the side which enables seeing.
- ▨ : Pattern of the rear side.

CA(RG) BOARD (Page 284 – 288)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A
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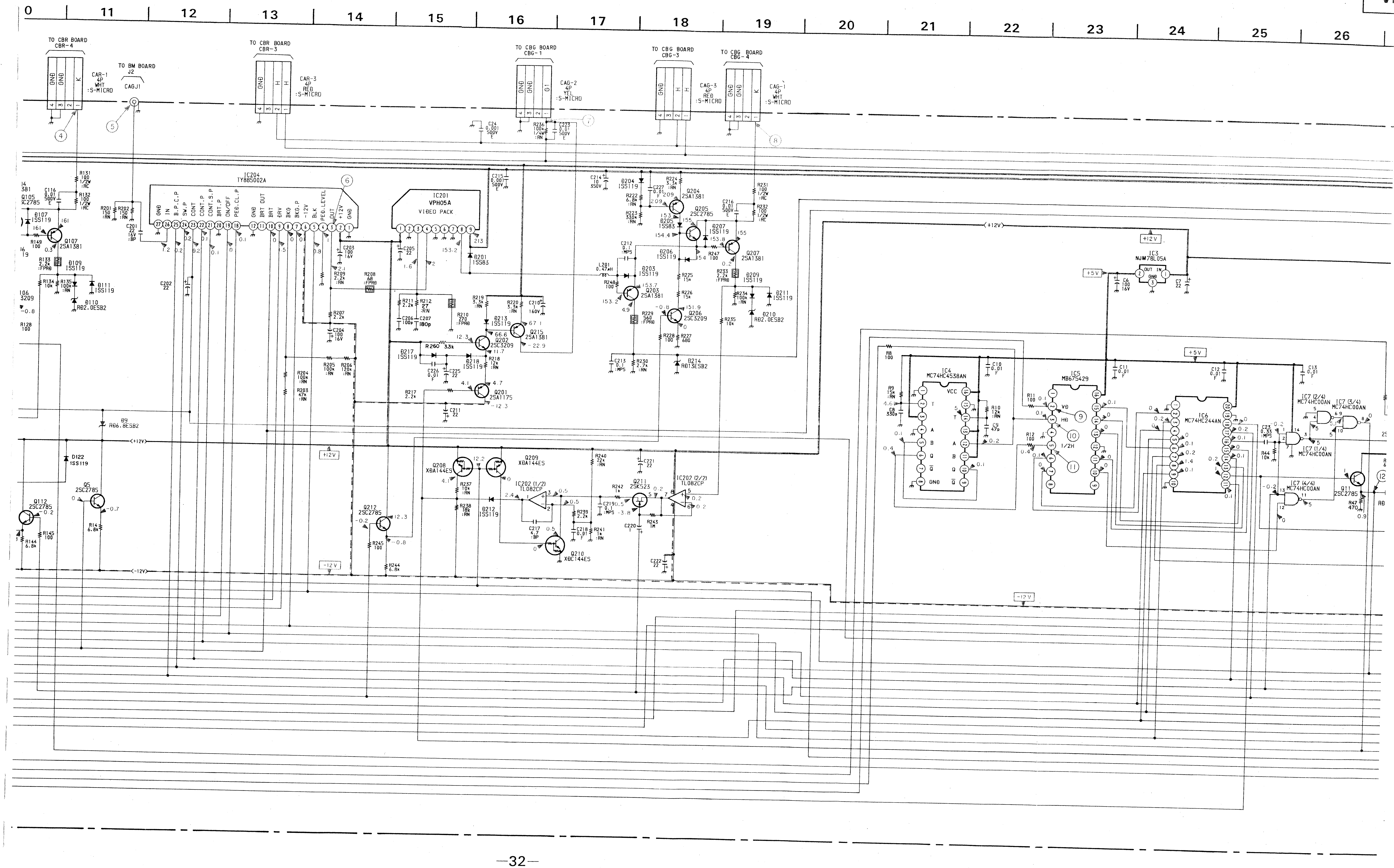
F
G
H
I
J
TO BM BOARD J1
CARJ1
TO CBR BOARD CBR-1
CAR-2 4P YEL :S-MICRO
TO CBR BOARD CBR-4
CAR-1 4P WHT :S-MICRO
TO BM BOARD J2
CAGJ1
TO CBR BOARD CBR-3
CAR-3 4P RED :S-MICRO
TO CBG BOARD CBG-1
IC104 TY885002A
IC101 VPH05A VIDEO PACK
IC204 TY885002A
IC201 VPH05A VIDEO PACK
Q113 2SC2785
Q104 2SA1381
Q105 2SC2785
Q107 2SA1381
Q103 2SA1381
Q106 2SC3209
Q113 2SA1381
Q115 2SA1381
Q102 2SC3209
Q101 2SA1175
IC1 LM7912CT
IC2 LM7812CT
Q1 2SC2785
Q2 XDC144ES
Q3 XDC144ES
Q4 2SC2785
D3 RD5.1ESB2
Q108 XDA144ES
Q109 XDA144ES
IC102 (1/2) TL082CP
IC102 (2/2) TL082CP
Q111 2SK523
Q110 XDC144ES
Q112 2SC2785
Q5 2SC2785
D9 RD6.8ESB2
D110 RD2.0ESB2
D114 RD13ESB2
Q215 2SA1381
Q202 2SC3209
Q201 2SA1175
Q208 XDA144ES
Q209 XDA144ES
IC202 (1/2) TL082CP
Q212 2SC2785
CAR-4
GND
+15V
-15V
1/2H
+12V PROT
HD
-12V PROT
VD
DRV (B)
DRV (R)
BKG (B)
BKG (R)
ON/OFF (B)
ON/OFF (R)
DRV (G)
BKG (G)
ON/OFF (G)
BLK
CONTRAST
BRT
CP
TO CFA BOARD CFA-1
-15V
-12V
+15V
+12V


10
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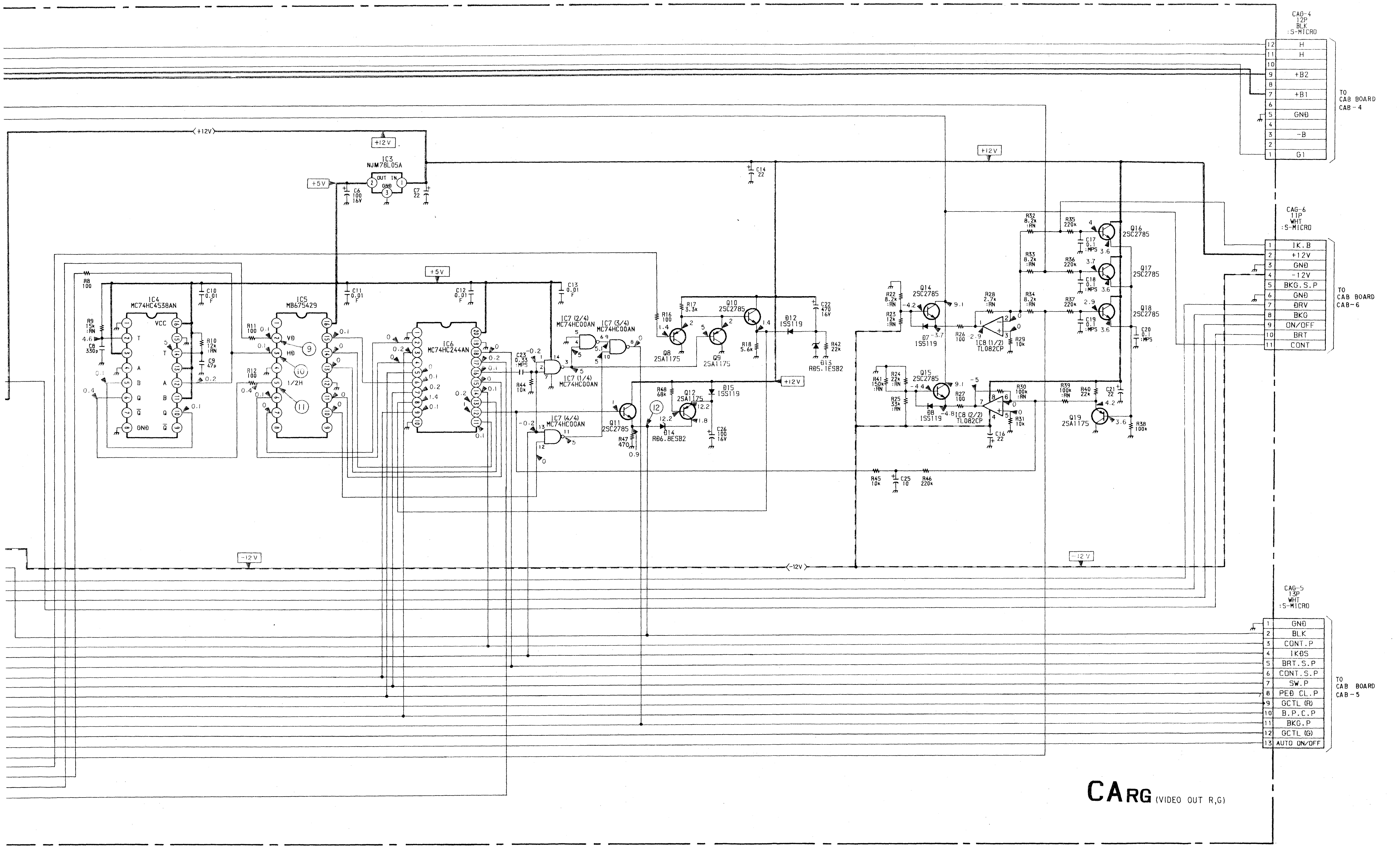
26
TO CBR BOARD CBR-4
CAR-1 4P WHT :S-MICRO
TO BM BOARD J2
CAGJ1
TO CBR BOARD CBR-3
CAR-3 4P RED :S-MICRO
TO CBG BOARD CBG-1
CAG-2 4P YEL :S-MICRO
TO CBG BOARD CBG-3
CAG-3 4P RED :S-MICRO
TO CBG BOARD CBG-4
CAG-1 4P WHT :S-MICRO
IC204 TY885002A
GND IN B.P.C.P SW.P CONT CONT.P CONT.S.P BRT.P ON/OFF PED.CL.P GND BRT OUT BRT DRV BKG BKG.P -12V BLK PED.LEVEL OUT +12V GND
IC201 VPH05A VIDEO PACK
Q107 2SA1381
Q105 2SC2785
D107 1SS119
D109 1SS119
D110 RD2.0ESB2
D111 1SS119
D9 RD6.8ESB2
D122 1SS119
Q112 2SC2785
Q5 2SC2785
Q202 2SC3209
Q215 2SA1381
Q201 2SA1175
D201 1SS83
D213 1SS119
D217 1SS119
D218 1SS119
Q204 2SA1381
Q205 2SC2785
Q203 2SA1381
Q206 2SC3209
Q207 2SA1381
D204 1SS119
D205 1SS83
D206 1SS119
D203 1SS119
D207 1SS119
D209 1SS119
D210 RD2.0ESB2
D211 1SS119
D214 RD13ESB2
L201 0.47μH
Q208 XBA144ES
Q209 XBA144ES
Q212 2SC2785
D212 1SS119
IC202 (1/2) TL082CP
IC202 (2/2) TL082CP
Q210 XBC144ES
Q211 2SK523
IC3 NJM78L05A
IC4 MC74HC4538AN
IC5 MB67S429
IC6 MC74HC244AN
IC7 (1/4) MC74HC00AN
IC7 (2/4) MC74HC00AN
IC7 (3/4) MC74HC00AN
IC7 (4/4) MC74HC00AN
Q11 2SC2785
+12V
-12V
+5V
VD
HD
1/2H
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪

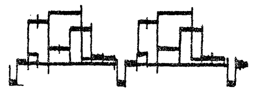

CAG-4 12P BLK :S-MICRO
12 H
11 H
10
9 +B2
8
7 +B1
6
5 GND
4
3 -B
2
1 G1
TO CAB BOARD CAB-4
CAG-6 11P WHT :S-MICRO
1 IK.B
2 +12V
3 GND
4 -12V
5 BKG.S.P
6 GND
7 DRV
8 BKG
9 ON/OFF
10 BRT
11 CONT
TO CAB BOARD CAB-6
CAG-5 13P WHT :S-MICRO
1 GND
2 BLK
3 CONT.P
4 IKDS
5 BRT.S.P
6 CONT.S.P
7 SW.P
8 PED CL.P
9 GCTL (R)
10 B.P.C.P
11 BKG.P
12 GCTL (G)
13 AUTO ON/OFF
TO CAB BOARD CAB-5
+12V
+5V
-12V
IC3 NJM78L05A
IC4 MC74HC4538AN
IC5 MB675429
IC6 MC74HC244AN
IC7 (1/4) MC74HC00AN
IC7 (2/4) MC74HC00AN
IC7 (3/4) MC74HC00AN
IC7 (4/4) MC74HC00AN
IC8 (1/2) TL082CP
IC8 (2/2) TL082CP
Q8 2SA1175
Q9 2SA1175
Q10 2SC2785
Q11 2SC2785
Q12 2SA1175
Q14 2SC2785
Q15 2SC2785
Q16 2SC2785
Q17 2SC2785
Q18 2SC2785
Q19 2SA1175
D7 1SS119
D8 1SS119
D12 1SS119
D13 RD5.1ESB2
D14 RD6.8ESB2
D15 1SS119
1/2H
VD
HD

CARG (VIDEO OUT R,G)

CA(RG)

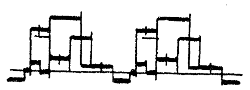
[VIDEO OUT R.G]

①



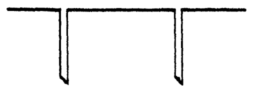
1.2Vp-p (H)

②



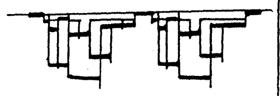
4.4Vp-p (H)

③



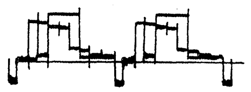
20Vp-p (H)

④



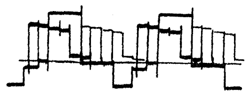
140Vp-p (H)

⑤



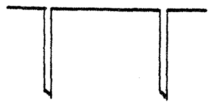
1.4Vp-p (H)

⑥



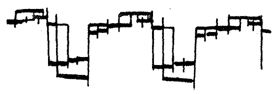
5.8Vp-p (H)

⑦



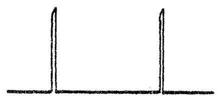
20Vp-p (H)

⑧



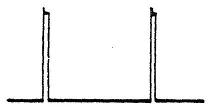
160Vp-p (H)

⑨



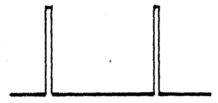
4Vp-p (H)

⑩



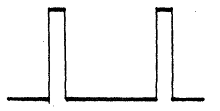
4Vp-p (H)

⑪



4Vp-p (H)

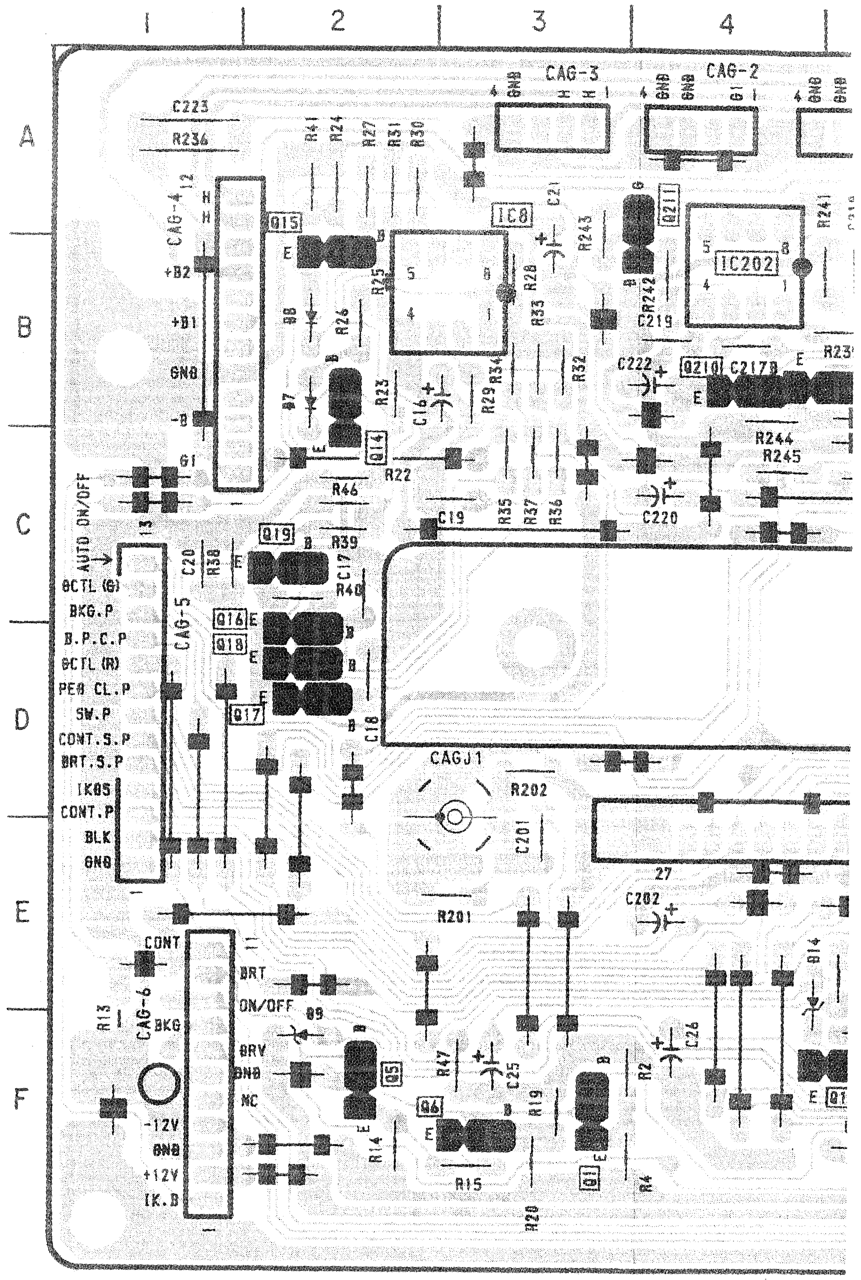
⑫



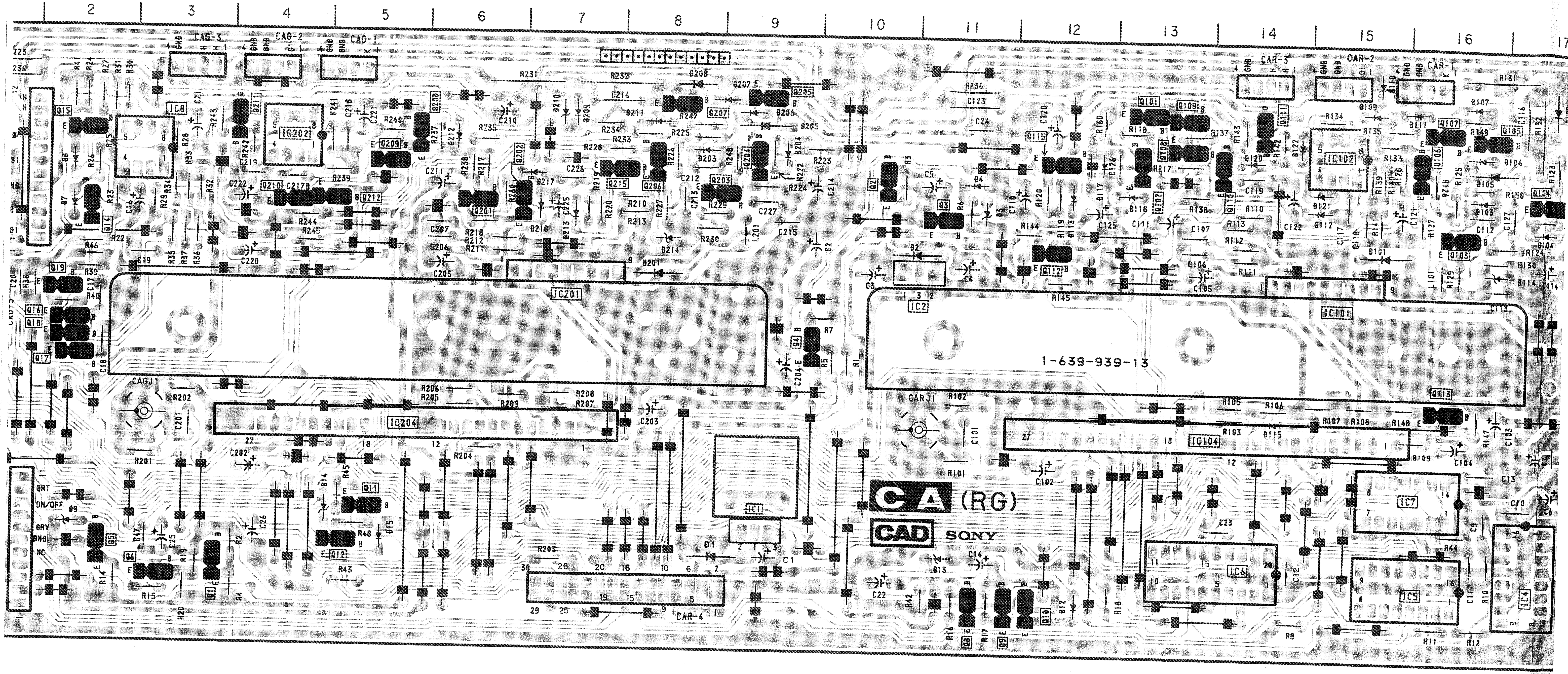
4Vp-p (H)

CA (RG)	IC1	LM7912CT	–12V REG	D1	V06C	–12V REG PROT
	2	LM7812CT	+12V REG	2	V06C	+12V REG PROT
	3	RC78L05A	+5V REG	3	RD5.1ESB2	+12V PROT
	4	MC74HC4538AN	PULSES GEN	4	1SS119	–12V PROT
	5	MB675429	PULSES GEN	7	1SS119	PEAK ABL
	6	MC74HC244AN	PULSES GEN	8	1SS119	S.T. ABL
	7	MC74HC00AN	PULSES GEN	9	RD6.8ESB2	CONT PROT
	8	TL082CP	PEAK&S.T. ABL	12	1SS119	ON STOP PROT
	101	VPH06	R VIDEO OUT	13	RD5.1ESB2	ON STOP PROT
	102	TL082CP	R AUTO BKG	14	RD6.8ESB2	OFF STOP PROT
	104	TY885002A	R SIGNAL PROCESS	15	1SS119	OFF STOP PROT
	201	VPH06	G VIDE OUT	101	1SS83	R VIDEO OUT PROT
	202	TL082CP	G AUTO BKG	103	1SS119	R Iκ DET-1 PROT
	204	TY885002A	G SIGNAL PROCESS	104	1SS119	R THERM COMP
				105	1SS83	R Iκ DET-2 PROT
	Q1	2SC2785	CONTRAST CONTROL	106	1SS119	R Iκ DET-2 PROT
	2	XDC114ES	+12V PROT	107	1SS119	R Iκ DET-2 PROT
	3	XDC114ES	+12V PROT	109	1SS119	R Iκ DET-2 PROT
	4	2SC2785	–12V PROT	110	RD2.0ESB2	R Iκ DET-2 PROT
	5	2SC2785	BRT-CONT CONTROL	111	1SS119	R Iκ DET-2 PROT
	8	2SA1175	BLK P. GEN	112	1SS119	R AUTO BKG SW
	9	2SA1175	BLK P. GEN	113	1SS119	R THERM COMP
	10	2SC2785	BLK P. GEN	114	RD13ESB2	R Iκ DET-1 PROT
	11	2SC2785	OFF SPOT PROT	115	1SS119	R γ CORR
	12	2SA1175	OFF SPOT PROT	117	1SS119	R OFF SPOT PROT
	14	2SC2785	PEAK ABL	118	1SS119	R OFF SPOT PROT
	15	2SC2785	S.T. ABL	120	1SS119	R AUTO BKG
	16	2SC2785	B S.T. ABL	121	1SS119	R AUTO BKG
	17	2SC2785	G S.T. ABL	122	1SS119	R AUTO BKG
	18	2SC2785	R S.T. ABL			
	19	2SA1175	S.T. ABL	201	1SS83	G VIDEO OUT PROT
	101	2SA1175	R G1 CONT	203	1SS119	G Iκ DET-1 PROT
	102	2SC3209	R G1 CONT	204	1SS119	G THERM COMP
	103	2SA1381	R Iκ DET-1	205	1SS83	G Iκ DET-2 PROT
	104	2SA1381	R CURRENT SOURCE	206	1SS119	G Iκ DET-2 PROT
	105	2SC2785	R Iκ DET-2	207	1SS119	G Iκ DET-2 PROT
	106	2SC3209	R Iκ DET-2	209	1SS119	G Iκ DET-2 PROT
	107	2SA1381	R Iκ DET-2	210	RD2.0ESB2	G Iκ DET-2 PROT
	108	XDA144ES	R AUTO BKG SW	211	1SS119	G Iκ DET-2 PROT
	109	XDA144ES	R AUTO BKG SW	212	1SS119	G AUTO BKG SW
	110	XDC114ES	R AUTO BKG SW	213	1SS119	G THERM COMP
	111	2SK523	R AUTO BKG	214	RD13ESB2	G Iκ DET-1 PROT
	112	2SC2785	R Iκ DET-2	217	1SS119	G OFF SPOT PROT
	113	2SC2785	R γ CORR	218	1SS119	G OFF SPOT PROT
	115	2SA1381	R G1 CONT			
	201	2SA1175	G G1 CONT			
	202	2SC3209	G G1 CONT			
	203	2SA1381	G Iκ DET-1			
	204	2SA1381	G CURRENT SOURCE			
	205	2SC2785	G Iκ DET-2			
	206	2SC3209	G Iκ DET-2			
	207	2SA1381	G Iκ DET-2			
	208	XDA144ES	G AUTO BKG SW			
	209	XDA144ES	G AUTO BKG SW			
	210	XDC114ES	G AUTO BKG SW			
	211	2SK523	G AUTO BKG			
	212	2SC2785	G Iκ DET-2			
	215	2SA1381	G G1 CONT			

– **CA(RG) BOARD** – (Page 289 – 292)



OARD – (Page 289 – 292)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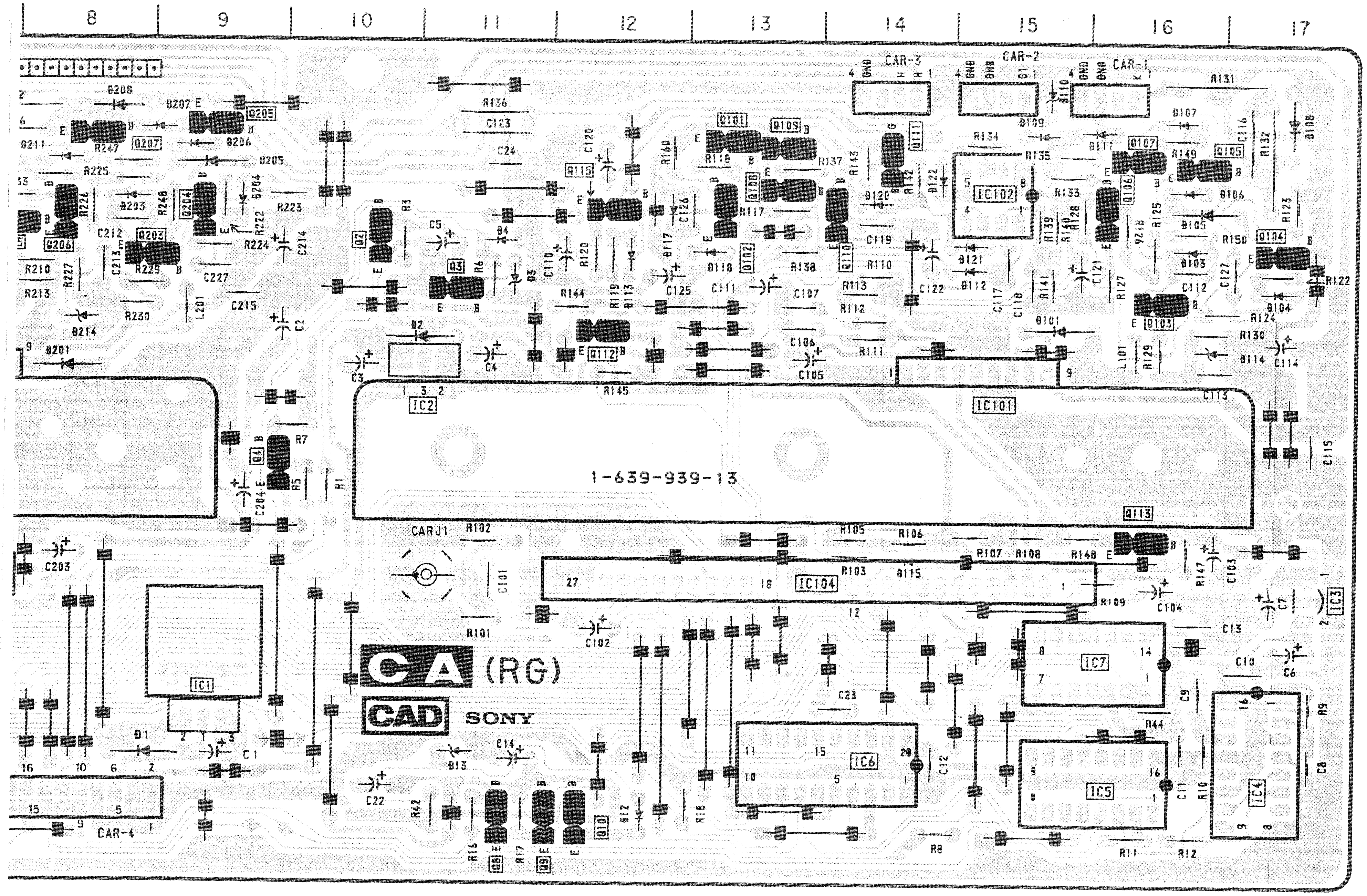
16
CAG-3
CAG-2
CAG-1
CAR-3
CAR-2
CAR-1
CAR-4
CAGJ1
CARJ1
IC1
IC2
IC4
IC5
IC6
IC7
IC8
IC101
IC102
IC104
IC201
IC202
IC204
1-639-939-13
BRT
ON/OFF
BRV
GND
NC
CA (RG)
CAD
SONY


8
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14
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17
CAR-1
CAR-2
CAR-3
CAR-4
IC1
IC2
IC4
IC5
IC6
IC7
IC101
IC102
IC104
CARJ1
1-639-939-13
CA (RG)
CAD
SONY

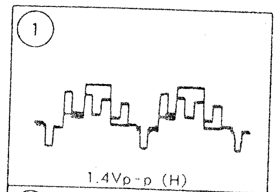
CA(RG) BOARD

IC	
IC1	F-9
IC2	C-11
IC3	E-17
IC4	F-17
IC5	F-16
IC6	F-14
IC7	D-16
IC8	B-3
IC101	C-15
IC102	B-15
IC104	D-14
IC201	C-7
IC202	B-4
IC204	E-5

TRANSISTOR	
Q1	F-3
Q2	B-10
Q3	B-11
Q4	D-10
Q5	F-2
Q6	F-3
Q8	F-11
Q9	F-12
Q10	F-12
Q11	E-5
Q12	F-5
Q14	B-2
Q15	B-2
Q16	D-2
Q17	D-2
Q18	D-2
Q19	C-2
Q101	A-13
Q102	B-13
Q103	C-16
Q104	B-17
Q105	A-17
Q106	B-16
Q107	A-16
Q108	B-13
Q109	A-13
Q110	B-14
Q111	A-14
Q112	C-12
Q113	D-16
Q115	B-12
Q201	B-6
Q202	B-6
Q203	B-9
Q204	B-9
Q205	A-9
Q206	B-8
Q207	A-8
Q208	B-5
Q209	B-5
Q210	B-4
Q211	A-4
Q212	B-5
Q215	B-7

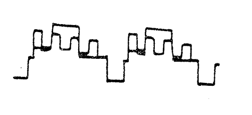
DIODE	
D1	F-9
D2	C-11
D3	B-11
D4	B-11
D7	B-2
D8	B-2
D9	F-2
D12	F-12
D13	F-11
D14	E-4
D15	F-5
D101	C-15
D103	B-16
D104	B-17
D105	B-16
D106	B-16
D107	A-16
D108	A-17
D109	A-15
D110	A-15
D111	A-16
D112	B-15
D113	B-12
D114	C-17
D115	D-14
D117	B-13
D118	B-13
D120	B-15
D121	B-15
D122	B-14
D201	C-8
D203	B-8
D204	B-9
D205	A-9
D206	A-9
D207	A-9
D208	A-8
D209	A-7
D210	A-7
D211	A-8
D212	B-6
D213	B-7
D214	C-8
D217	B-7
D218	B-7

①



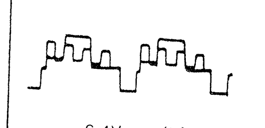
1.4Vp-p (H)

②



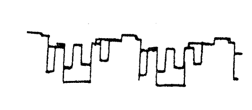
3Vp-p (H)

③



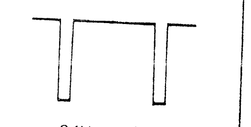
6.4Vp-p (H)

④



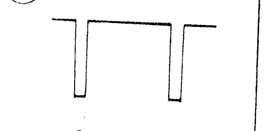
190Vp-p (H)

⑤



24Vp-p (H)

⑥



24Vp-p (H)

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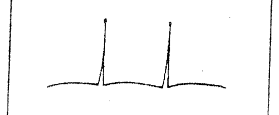
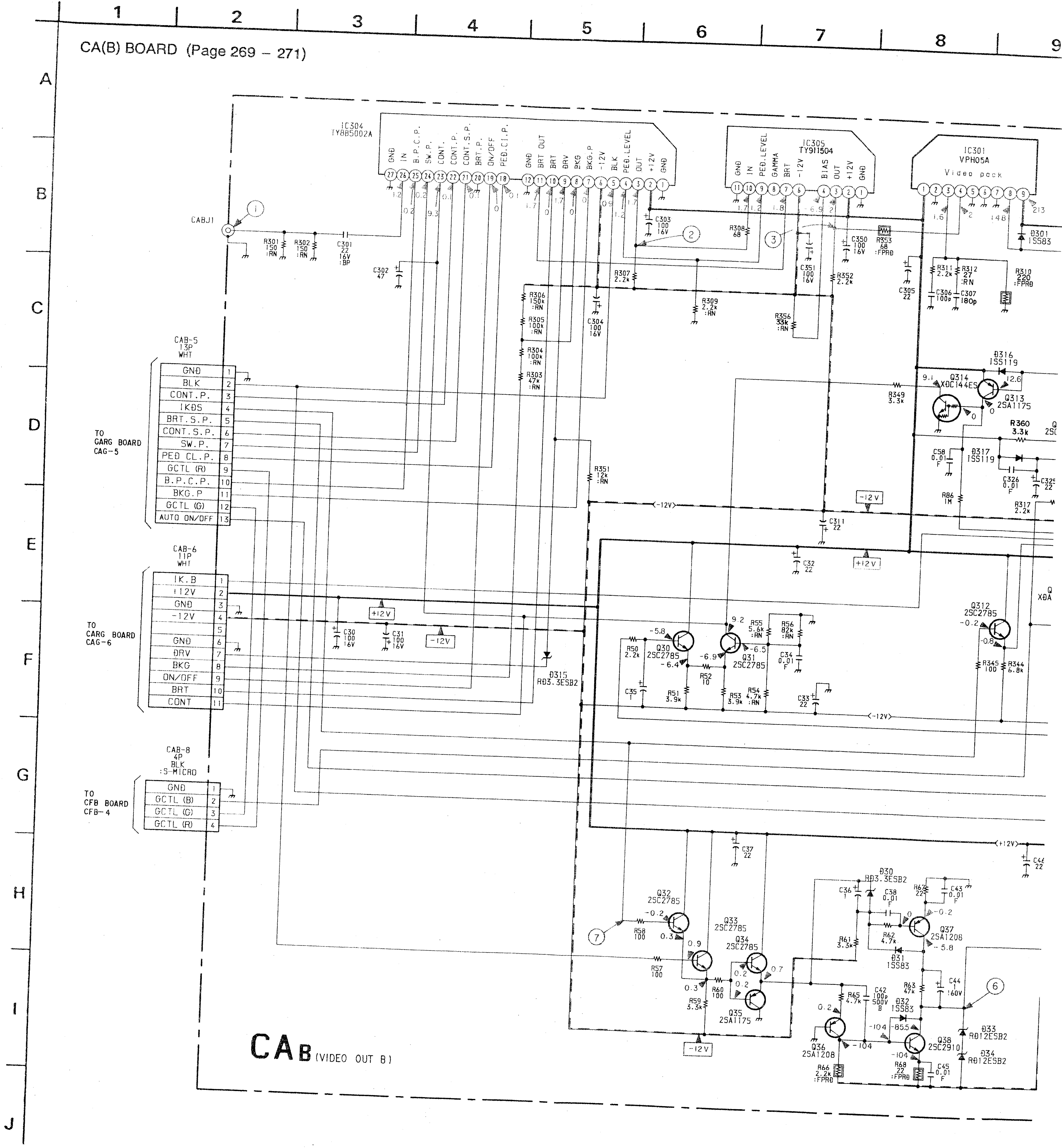


5Vp-p (H)

CA (B)	IC301	VPH06	B VIDEO OUT
	302	TL082CP	B AUTO BKG
	304	TY885002A	B SIGNAL PROCESS
	305	TY911504	B γ CORR
	Q30	2SC2785	ΣABL
	31	2SC2785	ΣABL
	32	2SC2785	BLK
	33	2SC2785	BLK
	34	2SC2785	BLK
	35	2SA1175	BLK
	36	2SA1208	BLK
	37	2SA1208	BLK
	38	2SC2910	BLK
	41	2SD982	+210V RIPPLE FILTER
	42	2SA1381	−100V RIPPLE FILTER
	43	2SA1381	+210V CURRENT PROT
	44	2SD982	+B1 RIPPLE FILTER
	45	2SC3209	ON SPOT PROT
	301	2SA1175	B G1 CONT
	302	2SC3209	B G1 CONT
	303	2SA1381	B Iκ DET-1
	304	2SA1381	B CURRENT SOURCE
	305	2SC2785	B Iκ DET-2
	306	2SC3209	B Iκ DET-2
	307	2SA1381	B Iκ DET-2
	308	XDA144ES	B AUTO BKG SW
	309	XDA144ES	B AUTO BKG SW
	310	XDC144ES	B AUTO BKG SW
	311	2SK523	B AUTO BKG
	312	2SC2785	B Iκ DET-2
	313	2SA1175	B SWING PROT
	314	XDC144ES	B SWING PROT
	315	2SA1381	B G1 CONT
	D30	RD3.3ESB2	BLK
	31	1SS83	BLK
	32	1SS83	BLK
	33	RD12ESB2	BLK
	34	RD12ESB2	BLK
	35	V06C	+210V RIPPLE FILTER PROT
	36	V06C	−100V RIPPLE FILTER PROT
	40	V06C	+B1 RIPPLE FILTER PROT
	41	1SS119	ON SPOT PROT
	301	1SS83	B VIDEO OUT PROT
	303	1SS119	B Iκ DET-1 PROT
	304	1SS119	B THERM COMP
	305	1SS83	B Iκ DET-2 PROT
	306	1SS119	B Iκ DET-2 PROT
	307	1SS119	B Iκ DET-2 PROT
	309	1SS119	B Iκ DET-2 PROT
	310	RD2.0ESB2	B Iκ DET-2 PROT
	311	1SS119	B Iκ DET-2 PROT
	312	1SS119	B AUTO BKG SW
	313	1SS119	B THERM COMP
	314	RD13ESB2	B Iκ DET-1 PROT
	315	RD3.3ESB2	B DRV
	316	1SS119	B SWING PROT
	317	1SS119	B OFF SPOT PROT
	318	1SS119	B OFF SPOT PROT

CA(B) BOARD (Page 269 − 271)



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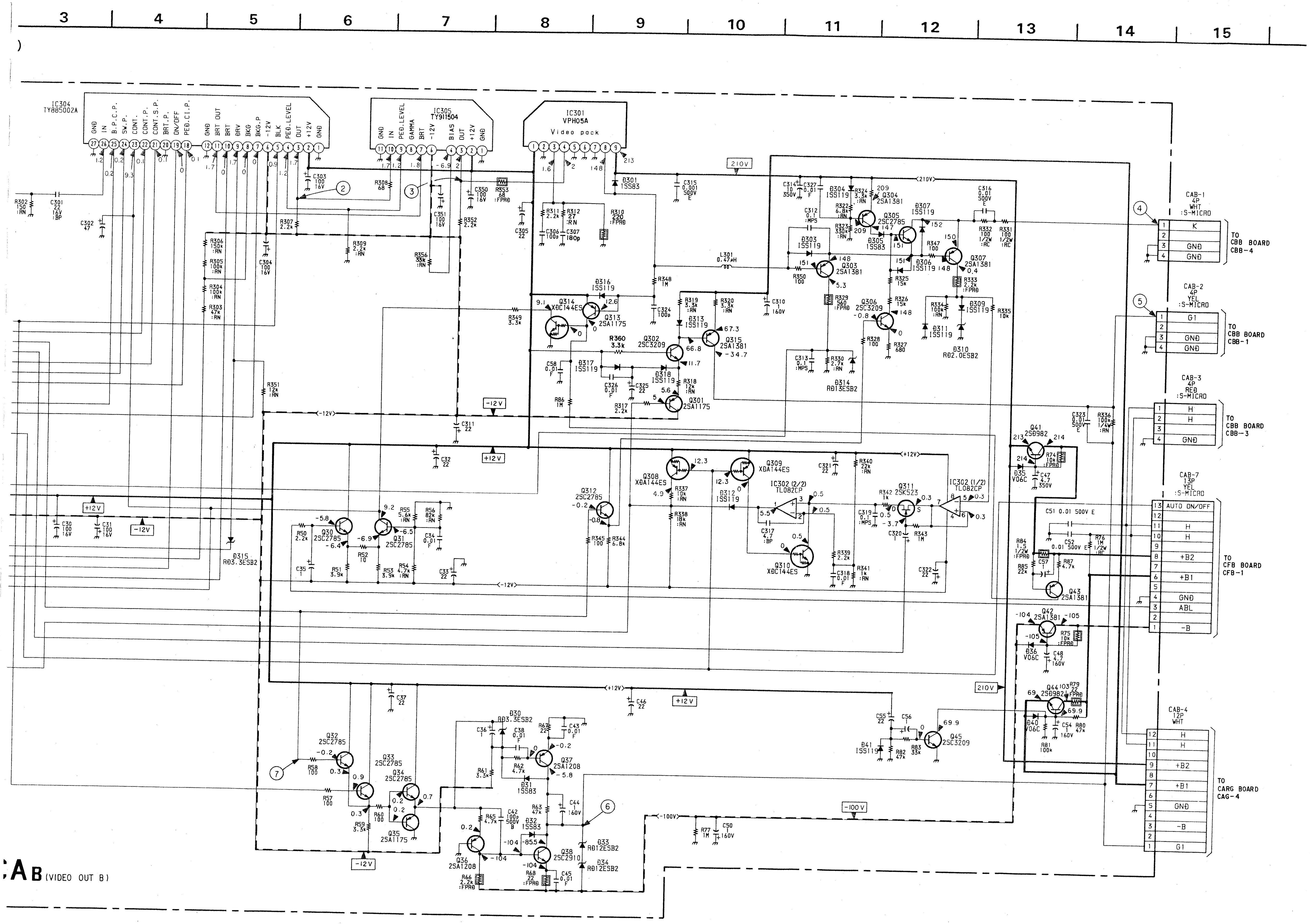
A
B
C
D
E
F
G
H
I
J
IC304
TY885002A
IC305
TY911504
IC301
VPH05A
Video pack
CABJ1
R301 150 :RN
R302 150 :RN
C301 22 16V :BP
C302 47
C303 100 16V
R306 150k :RN
R305 100k :RN
R304 100k :RN
R303 47k :RN
C304 100 16V
R307 2.2k
R308 68
R309 2.2k :RN
R351 12k :RN
C351 100 16V
R352 2.2k
R356 33k :RN
C350 100 16V
R353 68 :FPRD
C305 22
R311 2.2k
R312 27 :RN
C306 100p
C307 180p
R310 220 :FPRD
D301 1SS83
D316 1SS119
Q314 XDC144ES
Q313 2SA1175
R349 3.3k
R360 3.3k
C58 0.01 F
D317 1SS119
C326 0.01 F
R86 1M
R317 2.2k
C311 22
C32 22
CAB-5
13P
WHT
TO GARG BOARD CAG-5
GND 1
BLK 2
CONT.P. 3
IKDS 4
BRT.S.P. 5
CONT.S.P. 6
SW.P. 7
PED CL.P. 8
GCTL (R) 9
B.P.C.P. 10
BKG.P 11
GCTL (G) 12
AUTO ON/OFF 13
CAB-6
11P
WHT
TO CARG BOARD CAG-6
IK.B 1
+12V 2
GND 3
−12V 4
5
GND 6
DRV 7
BKG 8
ON/OFF 9
BRT 10
CONT 11
C30 100 16V
C31 100 16V
+12V
−12V
D315 RD3.3ESB2
R50 2.2k
Q30 2SC2785
Q31 2SC2785
R55 5.6k :RN
R56 82k :RN
C34 0.01 F
R52 10
R51 3.9k
R53 3.9k
R54 4.7k :RN
C35
C33 22
Q312 2SC2785
R345 100
R344 6.8k
CAB-8
4P
BLK
:S-MICRO
TO CFB BOARD CFB-4
GND 1
GCTL (B) 2
GCTL (G) 3
GCTL (R) 4
C37 22
Q32 2SC2785
Q33 2SC2785
Q34 2SC2785
Q35 2SA1175
R58 100
R57 100
R60 100
R59 3.3k
D30 RD3.3ESB2
C36
C38
C43 0.01 F
Q37 2SA1208
R61 3.3k
R62 4.7k
D31 1SS83
R65 4.7k
C42 100p 500V B
R63 47k
D32 1SS83
C44 160V
Q36 2SA1208
Q38 2SC2910
D33 RD12ESB2
D34 RD12ESB2
R66 2.2k :FPRD
R68 22 :FPRD
C45 0.01 F
C4 22
(−12V)
(+12V)
①
②
③
⑥
⑦

CAB (VIDEO OUT B)


3
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12
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15
IC304 TY885002A
IC305 TY911504
IC301 VPH05A Video pack
210V
-12V
+12V
-100V
CAB-1 4P WHT :S-MICRO
TO CBB BOARD CBB-4
CAB-2 4P YEL :S-MICRO
TO CBB BOARD CBB-1
CAB-3 4P RED :S-MICRO
TO CBB BOARD CBB-3
CAB-7 13P YEL :S-MICRO
AUTO ON/OFF
TO CFB BOARD CFB-1
CAB-4 12P WHT
TO CARG BOARD CAG-4
K
GND
G1
H
+B2
+B1
ABL
-B
IC302 (2/2) TL082CP
IC302 (1/2) TL082CP
Q41 2SD982
Q42 2SA1381
Q43 2SA1381
Q44 2SD982
Q45 2SC3209
Q30 2SC2785
Q31 2SC2785
Q32 2SC2785
Q33 2SC2785
Q34 2SC2785
Q35 2SA1175
Q36 2SA1208
Q37 2SA1208
Q38 2SC2910
Q301 2SA1175
Q302 2SC3209
Q303 2SA1381
Q304 2SA1381
Q305 2SC2785
Q306 2SC3209
Q307 2SA1381
Q308 XDA144ES
Q309 XDA144ES
Q310 XDC144ES
Q311 2SK523
Q312 2SC2785
Q313 2SA1175
Q314 XDC144ES
Q315 2SA1381
②
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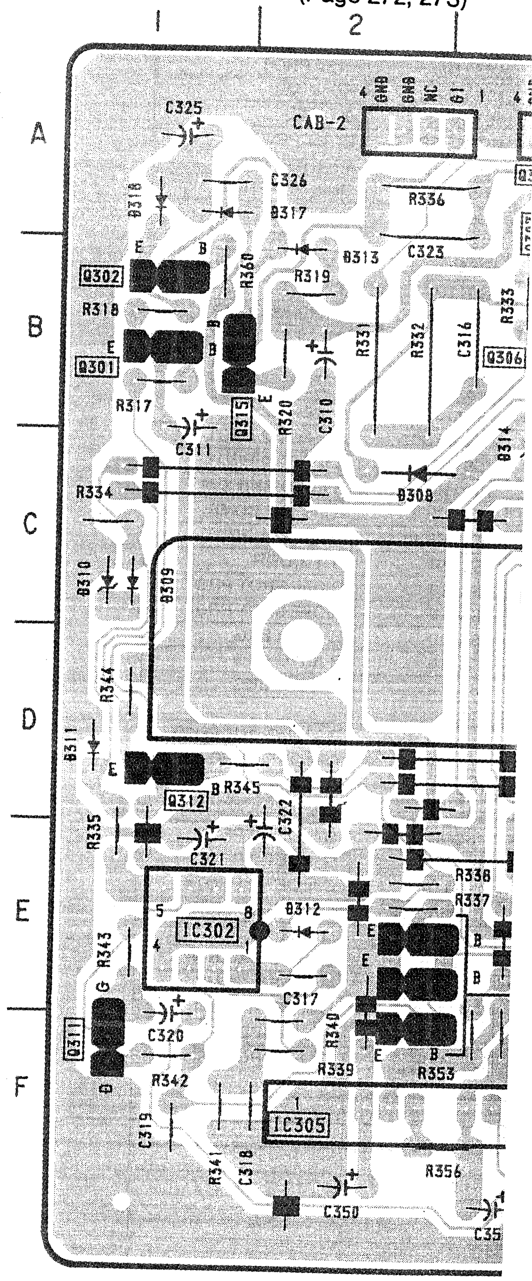
CA B (VIDEO OUT B)

CA(E

– **CA (B) BOARD** – (Page 272, 273)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A
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C325
C326
D317
R336
D318
D313
C323
Q302
R360
R319
R318
Q301
R331
R332
C316
R333
Q306
R317
Q315
R320
C310
C311
R334
D308
D310
D309
R344
D311
R345
Q312
C322
R335
C321
R338
R337
IC302
D312
R343
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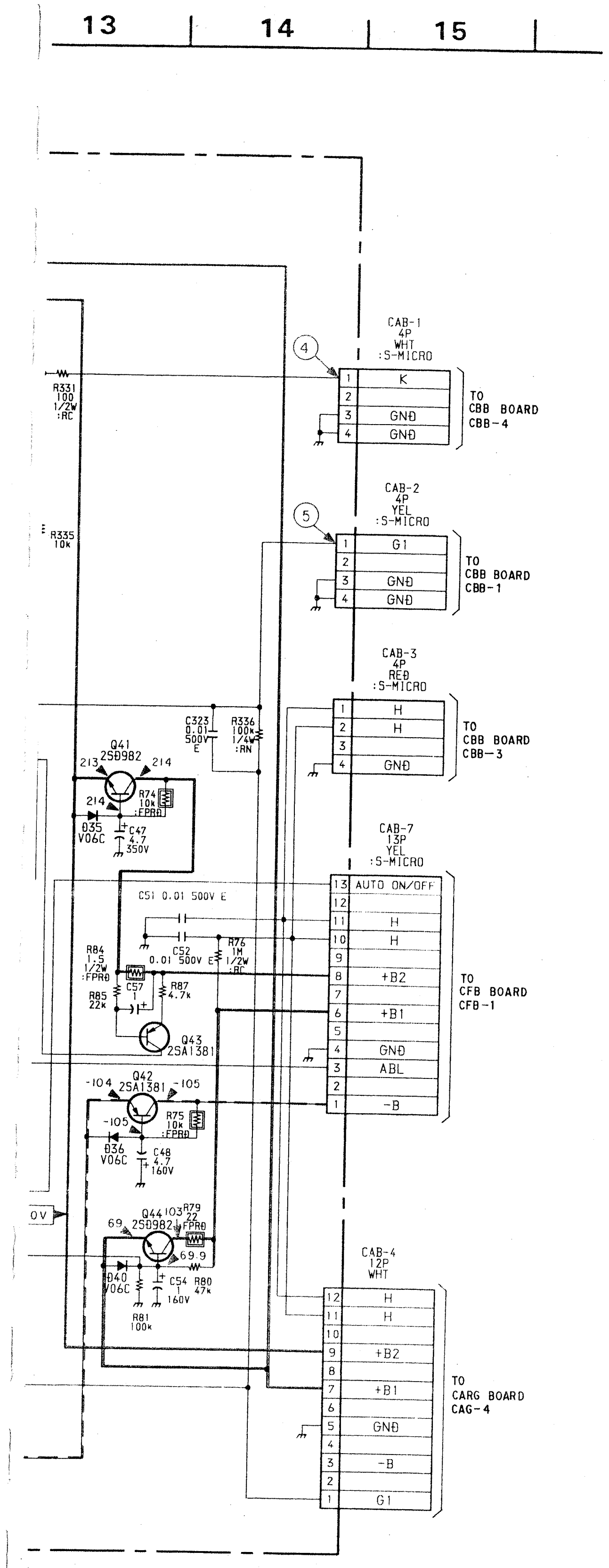
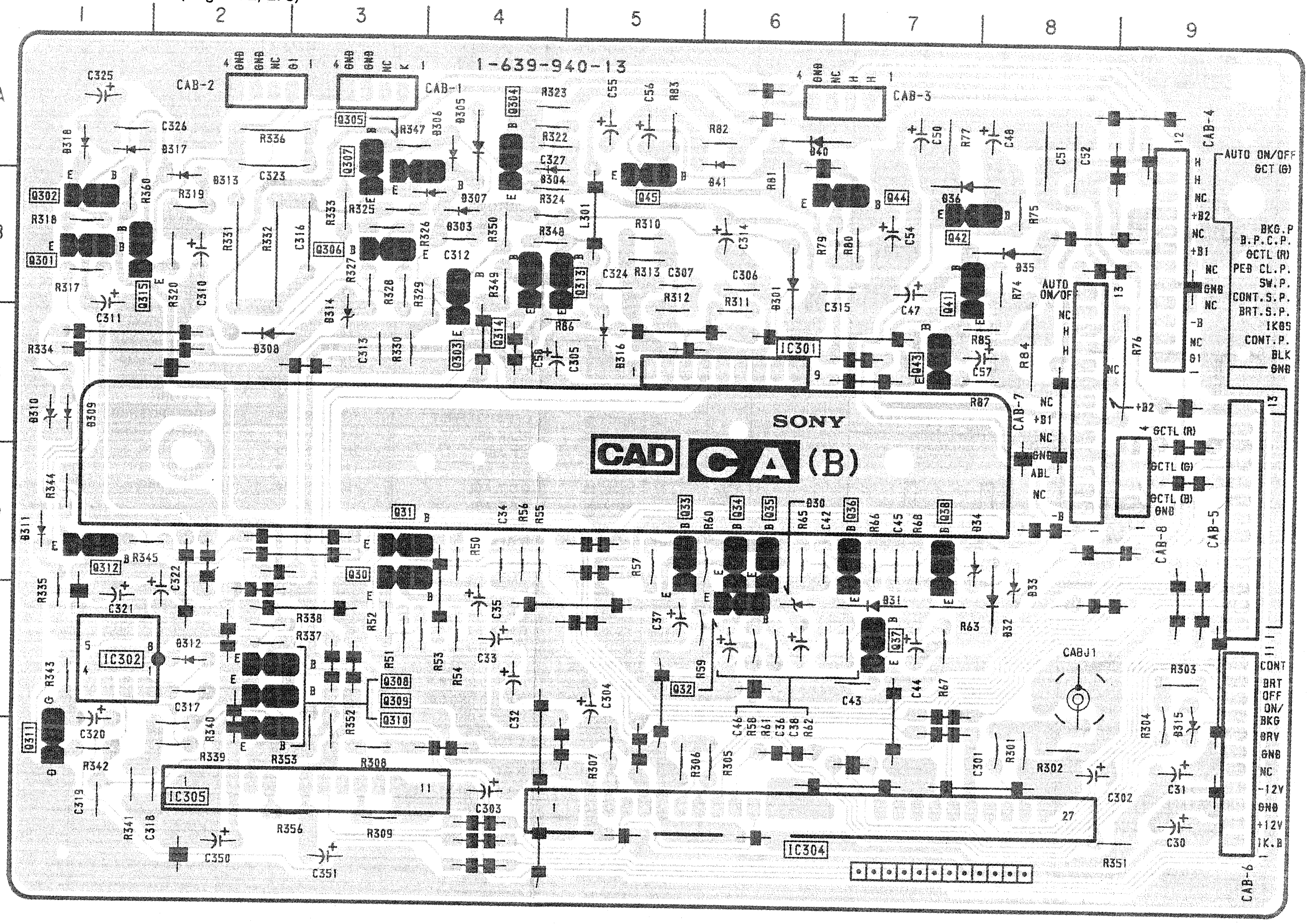
C319
R341
C318
R356
C350
C35


13
14
15
CAB-1 4P WHT :S-MICRO
K
GND
GND
TO CBB BOARD CBB-4
CAB-2 4P YEL :S-MICRO
G1
GND
GND
TO CBB BOARD CBB-1
CAB-3 4P RED :S-MICRO
H
H
GND
TO CBB BOARD CBB-3
Q41 2SB982
Q43 2SA1381
Q42 2SA1381
Q44 2SD982
D35 V06C
D36 V06C
D40 V06C
CAB-7 13P YEL :S-MICRO
AUTO ON/OFF
H
H
+B2
+B1
GND
ABL
-B
TO CFB BOARD CFB-1
C51 0.01 500V E
CAB-4 12P WHT
H
H
+B2
+B1
GND
-B
G1
TO CARG BOARD CAG-4
0V

CA(B) [VIDEO OUT B]

– CA (B) BOARD – (Page 272, 273)


1
2
3
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5
6
7
8
9
A
B
C
D
E
F
1-639-940-13
CAB-1
CAB-2
CAB-3
CAB-4
CAB-5
CAB-6
CAB-7
CAB-8
CABJ1
IC301
IC302
IC304
IC305
SONY
CAD
CA (B)
AUTO ON/OFF
BKG.P
B.P.C.P.
CONT.S.P.
BRT.S.P.
IKGS
CONT.P.
BLK
GND

CA(B) BOARD

IC	
IC301	C-6
IC302	E-1
IC304	F-6
IC305	F-2

TRANSISTOR	
Q30	E-3
Q31	D-3
Q32	E-6
Q33	D-5
Q34	D-6
Q35	D-6
Q36	D-7
Q37	E-7
Q38	D-7
Q41	B-7
Q42	B-7
Q43	C-7
Q44	B-7
Q45	B-5
Q301	B-1
Q302	B-1
Q303	C-4
Q304	A-4
Q305	A-3
Q306	B-3
Q307	A-3
Q308	E-2
Q309	E-2
Q310	F-2
Q311	F-1
Q312	D-1
Q313	B-5
Q314	B-4
Q315	B-1

DIODE	
D30	E-6
D31	D-8
D32	E-8
D33	E-8
D34	D-8
D35	B-8
D36	B-7
D40	A-6
D41	A-6
D301	B-6
D303	B-4
D304	B-4
D305	A-4
D306	A-4
D307	B-4
D309	C-1
D310	C-1
D311	D-1
D312	E-2
D313	B-2
D314	C-3
D315	F-9
D316	C-5
D317	A-1
D318	A-1

SECTION 9
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

- The components identified by ⧓ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
- ※ : Selected to yield optimum performance.
- There are some cases the reference number on one board overlaps on the other board. Therefore, when ordering parts by the reference number, please include the board name.

REF.NO.	PART NO.	DESCRIPTION			REMARK
	*A-1135-692-A	BA BOARD, COMPLETE ******************			
	*1-568-984-11	CONNECTOR, MALE 96P			
	1-570-859-11	SWITCH, SLIDE			
	4-382-854-11	SCREW (M3X10), P, SW (+)			
		<MODULE>			
BPF1	1-236-366-11	MODULE, TRAP			
BPF2	1-236-365-11	MODULE, TRAP			
		<CAPACITOR>			
C1	1-124-910-11	ELECT	47MF	20%	50V
C2	1-124-910-11	ELECT	47MF	20%	50V
C3	1-124-910-11	ELECT	47MF	20%	50V
C7	1-124-907-11	ELECT	10MF	20%	50V
C8	1-124-122-11	ELECT	100MF	20%	50V
C9	1-124-122-11	ELECT	100MF	20%	50V
C10	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C11	1-124-907-11	ELECT	10MF	20%	50V
C12	1-124-910-11	ELECT	47MF	20%	50V
C13	1-124-910-11	ELECT	47MF	20%	50V
C14	1-124-910-11	ELECT	47MF	20%	50V
C15	1-124-910-11	ELECT	47MF	20%	50V
C16	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C17	1-124-910-11	ELECT	47MF	20%	50V
C18	1-124-910-11	ELECT	47MF	20%	50V
C23	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C24	1-124-910-11	ELECT	47MF	20%	50V
C25	1-124-910-11	ELECT	47MF	20%	50V
C26	1-124-910-11	ELECT	47MF	20%	50V
C27	1-124-910-11	ELECT	47MF	20%	50V
C28	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C29	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C30	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C31	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C32	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C33	1-124-907-11	ELECT	10MF	20%	50V
C34	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C35	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C36	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C37	1-124-903-11	ELECT	1MF	20%	50V
C39	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C40	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C41	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C42	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C43	1-124-907-11	ELECT	10MF	20%	50V
C44	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C45	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C46	1-124-119-00	ELECT	330MF	20%	16V
C47	1-124-119-00	ELECT	330MF	20%	16V
C48	1-163-035-00	CERAMIC CHIP	0.047MF		50V
C49	1-136-153-00	FILM	0.01MF	5%	50V
C50	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C51	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C52	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C53	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C54	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C55	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C56	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C57	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C58	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C59	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C60	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C61	1-136-177-00	FILM	1MF	5%	50V
C62	1-136-177-00	FILM	1MF	5%	50V
C63	1-124-122-11	ELECT	100MF	20%	50V
C67	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C68	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C69	1-163-120-00	CERAMIC CHIP	130PF	5%	50V
C70	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C71	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C72	1-124-927-11	ELECT	4.7MF	20%	50V
C73	1-124-903-11	ELECT	1MF	20%	50V
C74	1-136-171-00	FILM	0.33MF	5%	50V
C75	1-130-479-00	MYLAR	0.0047MF	5%	50V
C76	1-163-157-00	FILM	0.022MF	5%	50V
C77	1-163-157-00	FILM	0.022MF	5%	50V
C78	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C79	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C82	1-136-177-00	FILM	1MF	5%	50V
C83	1-124-907-11	ELECT	10MF	20%	50V
C84	1-124-910-11	ELECT	47MF	20%	50V
C85	1-124-907-11	ELECT	10MF	20%	50V
C86	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C87	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C88	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C89	1-164-161-11	CERAMIC CHIP	0.0022MF		50V
C90	1-124-122-11	ELECT	100MF	20%	50V
C91	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C104	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C106	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C201	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C202	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C203	1-163-157-00	FILM	0.022MF	5%	50V
C205	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C207	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C208	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C211	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C212	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C213	1-124-122-11	ELECT	100MF	20%	50V

BA

REF.NO.	PART NO.	DESCRIPTION		REMARK	
C214	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C215	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C216	1-124-122-11	ELECT	100MF	20%	50V
C217	1-124-122-11	ELECT	100MF	20%	50V
C218	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C219	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C220	1-124-122-11	ELECT	100MF	20%	50V
C221	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C222	1-124-122-11	ELECT	100MF	20%	50V
C223	1-124-122-11	ELECT	100MF	20%	50V
C224	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C229	1-124-907-11	ELECT	10MF	20%	50V
C230	1-124-122-11	ELECT	100MF	20%	50V
C231	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C234	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C235	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C236	1-124-907-11	ELECT	10MF	20%	50V
C237	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C238	1-124-907-11	ELECT	10MF	20%	50V
C239	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C240	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C241	1-124-927-11	ELECT	4.7MF	20%	50V
C242	1-124-907-11	ELECT	10MF	20%	50V
C243	1-124-907-11	ELECT	10MF	20%	50V
C244	1-124-907-11	ELECT	10MF	20%	50V
C301	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C302	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C303	1-126-233-11	ELECT	22MF	20%	50V
C304	1-163-227-11	CERAMIC CHIP	10PF	5%	50V
C305	1-126-233-11	ELECT	22MF	20%	50V
C306	1-124-910-11	ELECT	47MF	20%	50V
C307	1-136-169-00	FILM	0.22MF	5%	50V
C308	1-124-902-00	ELECT	0.47MF	20%	50V
C309	1-124-902-00	ELECT	0.47MF	20%	50V
C310	1-124-902-00	ELECT	0.47MF	20%	50V
C311	1-126-233-11	ELECT	22MF	20%	50V
C312	1-124-910-11	ELECT	47MF	20%	50V
C313	1-124-910-11	ELECT	47MF	20%	50V
C314	1-124-910-11	ELECT	47MF	20%	50V
C315	1-124-910-11	ELECT	47MF	20%	50V
C316	1-124-902-00	ELECT	0.47MF	20%	50V
C317	1-126-101-11	ELECT	100MF	20%	16V
C318	1-124-910-11	ELECT	47MF	20%	50V
C319	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C320	1-163-031-11	CERAMIC CHIP	0.01MF		50V
C321	1-124-907-11	ELECT	10MF	20%	50V
C322	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C323	1-124-907-11	ELECT	10MF	20%	50V
C324	1-124-902-00	ELECT	0.47MF	20%	50V
C325	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C326	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C327	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C328	1-163-033-00	CERAMIC CHIP	0.022MF		50V
C329	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C330	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C331	1-136-177-00	FILM	1MF	5%	50V
C332	1-136-169-00	FILM	0.22MF	5%	50V
C333	1-124-907-11	ELECT	10MF	20%	50V
C334	1-124-910-11	ELECT	47MF	20%	50V
C335	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C336	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C337	1-163-089-00	CERAMIC CHIP	6PF	0.25PF	50V
C338	1-124-907-11	ELECT	10MF	20%	50V
C339	1-124-903-11	ELECT	1MF	20%	50V
C340	1-124-903-11	ELECT	1MF	20%	50V
C341	1-124-907-11	ELECT	10MF	20%	50V
C342	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C343	1-124-910-11	ELECT	47MF	20%	50V
C344	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C346	1-124-907-11	ELECT	10MF	20%	50V
C347	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C350	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C351	1-124-903-11	ELECT	1MF	20%	50V
C352	1-124-907-11	ELECT	10MF	20%	50V

<TRIMMER>

CT101	1-141-181-11	CAP,TRIMMER
CT102	1-141-181-11	CAP,TRIMMER

<DIODE>

D1	8-719-400-18	DIODE MA152WK
D2	8-719-400-18	DIODE MA152Wk
D3	8-719-400-18	DIODE MA152WK
D4	8-719-400-18	DIODE MA152WK
D5	8-719-400-18	DIODE MA152WK
D6	8-719-104-34	DIODE 1S2836
D7	8-719-400-18	DIODE MA152WK
D8	8-719-400-18	DIODE MA152WK
D9	8-719-400-18	DIODE MA152WK
D10	8-719-400-18	DIODE MA152WK
D11	8-719-800-76	DIODE 1SS226
D12	8-719-400-18	DIODE MA152WK
D13	8-719-400-18	DIODE MA152WK
D14	8-719-400-18	DIODE MA152WK
D101	8-719-105-46	DIODE RD3.3M-B2
D102	8-719-105-82	DIODE RD5.1M-B2
D103	8-719-400-18	DIODE MA152WK
D107	8-719-400-18	DIODE MA152WK
D108	8-719-900-95	DIODE V09G
D109	8-719-900-95	DIODE V09G
D110	8-719-105-XX	DIODE RD6.2M-B1
D112	8-719-400-18	DIODE MA152WK
D113	8-719-400-18	DIODE MA152WK
D118	8-719-104-34	DIODE 1S2836
D119	8-719-400-18	DIODE MA152WK
D130	8-719-400-18	DIODE MA152WK
D132	8-719-104-34	DIODE 1S2836
D201	8-719-400-18	DIODE MA152WK
D301	8-719-400-18	DIODE MA152WK
D303	8-719-400-18	DIODE MA152WK
D304	8-719-105-63	DIODE RD4.3M-B1
D350	8-719-400-18	DIODE MA152WK
D351	8-719-400-18	DIODE MA152WK
D352	8-719-400-18	DIODE MA152WK

<DELAY LINE>

DL101	1-415-122-31	DELAY LINE, 1H (PAL)
DL102	1-402-679-11	DELAY LINE
DL103	1-415-494-11	DELAY LINE, Y
DL104	1-415-494-11	DELAY LINE, Y

<FILTER>

FL1	1-236-164-11	ENCAPSULATED COMPONENT
FL2	1-236-620-11	FILTER, LOW PASS

BA

REF.NO.	PART NO.	DESCRIPTION	REMARK
FL3	1-236-620-11	FILTER, LOW PASS	
FL4	1-236-620-11	FILTER, LOW PASS	
		<IC>	
IC1	8-759-300-71	IC HD14053BFP	
IC2	8-759-513-47	IC TDA4555/V1	
IC3	8-759-932-16	IC TDA4565	
IC5	8-759-710-42	IC NJM2228M	
IC6	8-759-208-94	IC CX-894	
IC7	8-759-300-71	IC HD14053BFP	
IC8	8-752-034-85	IC CXA1216P	
IC9	8-759-100-96	IC UPC4558G2	
IC10	8-741-692-01	IC SBX1692-01	
IC11	8-759-979-16	IC CX-7916	
IC12	1-808-891-11	MODULE SNY-9202	
IC13	8-759-100-96	IC UPC4558G2	
IC14	8-759-929-84	IC SN74LS12NS	
IC15	1-809-576-11	MODULE, H8B7178B	
IC16	8-759-929-62	IC LM7812CT	
IC17	8-759-504-46	IC PQ05RF1	
IC19	8-759-926-06	IC SN74HC126ANS	
		<COIL>	
L101	1-410-470-11	INDUCTOR 10UH	
L102	1-410-209-51	INDUCTOR CHIP 27UH	
L103	1-410-466-41	INDUCTOR 4.7UH	
L104	1-408-406-00	INDUCTOR 5.6UH	
L105	1-404-539-11	COIL	
L106	1-404-554-11	COIL	
L107	1-404-554-11	COIL	
L108	1-404-554-11	COIL	
L109	1-408-397-00	INDUCTOR 1UH	
L110	1-410-466-41	INDUCTOR 4.7UH	
L111	1-410-466-41	INDUCTOR 4.7UH	
L112	1-410-466-41	INDUCTOR 4.7UH	
L114	1-459-155-00	COIL (WITH CORE) 45UH	
L115	1-459-155-00	COIL (WITH CORE) 45UH	
L116	1-410-466-41	INDUCTOR 4.7UH	
L120	1-404-584-11	COIL	
L136	1-408-777-00	INDUCTOR CHIP 10UH	
		<TRANSISTOR>	
Q2	8-729-901-01	TRANSISTOR DTC144EK	
Q3	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q7	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q8	8-729-901-01	TRANSISTOR DTC144EK	
Q9	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q10	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q11	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q12	8-729-216-22	TRANSISTOR 2SA1162-G	
Q13	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q14	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q15	8-729-901-01	TRANSISTOR DTC144EK	
Q16	8-729-901-01	TRANSISTOR DTC144EK	
Q17	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q18	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q19	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q20	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q21	8-729-901-01	TRANSISTOR DTC144EK	
Q22	8-729-901-01	TRANSISTOR DTC144EK	
Q23	8-729-901-01	TRANSISTOR DTC144EK	
Q24	8-729-901-01	TRANSISTOR DTC144EK	
Q25	8-729-901-01	TRANSISTOR DTC144EK	
Q26	8-729-901-01	TRANSISTOR DTC144EK	
Q27	8-729-901-01	TRANSISTOR DTC144EK	
Q28	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q29	8-729-216-22	TRANSISTOR 2SA1162-G	
Q30	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q31	8-729-216-22	TRANSISTOR 2SA1162-G	
Q32	8-729-216-22	TRANSISTOR 2SA1162-G	
Q33	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q34	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q35	8-729-901-01	TRANSISTOR DTC144EK	
Q36	8-729-216-22	TRANSISTOR 2SA1162-G	
Q37	8-729-901-01	TRANSISTOR DTC144EK	
Q38	8-729-901-01	TRANSISTOR DTC144EK	
Q39	8-729-116-06	TRANSISTOR 2SK160-K6	
Q40	8-729-116-06	TRANSISTOR 2SK160-K6	
Q41	8-729-901-01	TRANSISTOR DTC144EK	
Q43	8-729-901-01	TRANSISTOR DTC144EK	
Q45	8-729-901-01	TRANSISTOR DTC144EK	
Q48	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q49	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q50	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q51	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q52	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q118	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q119	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q120	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q152	8-729-901-01	TRANSISTOR DTC144EK	
Q201	8-729-901-01	TRANSISTOR DTC144EK	
Q202	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q203	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q204	8-729-901-01	TRANSISTOR DTC144EK	
Q205	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q206	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q207	8-729-100-66	TRANSISTOR 2SC1623-L6	
Q208	8-729-901-01	TRANSISTOR DTC144EK	
Q209	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q210	8-729-216-22	TRANSISTOR 2SA1162-G	
Q212	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q213	8-729-216-22	TRANSISTOR 2SA1162-G	
Q301	8-729-140-96	TRANSISTOR 2SD774-34	
Q302	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q303	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q304	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q305	8-729-901-01	TRANSISTOR DTC144EK	
Q306	8-729-901-01	TRANSISTOR DTC144EK	
Q307	8-729-901-01	TRANSISTOR DTC144EK	
Q308	8-729-901-01	TRANSISTOR DTC144EK	
Q309	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q310	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q311	8-729-901-01	TRANSISTOR DTC144EK	
Q312	8-729-901-01	TRANSISTOR DTC144EK	
Q313	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q314	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q315	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q316	8-729-901-01	TRANSISTOR DTC144EK	
Q317	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q318	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q319	8-729-901-01	TRANSISTOR DTC144EK	
Q320	8-729-901-01	TRANSISTOR DTC144EK	
Q321	8-729-901-01	TRANSISTOR DTC144EK	
Q323	8-729-230-49	TRANSISTOR 2SC2712-YG	

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REF.NO.	PART NO.	DESCRIPTION				REMARK
Q324	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q325	8-729-901-01	TRANSISTOR DTC144EK				
Q326	8-729-901-01	TRANSISTOR DTC144EK				
Q327	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q329	8-729-116-06	TRANSISTOR 2SK160-K6				
Q330	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q336	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q337	8-729-216-22	TRANSISTOR 2SA1162-G				
Q338	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q340	8-729-901-01	TRANSISTOR DTC144EK				
Q350	8-729-901-01	TRANSISTOR DTC144EK				
Q351	8-729-230-49	TRANSISTOR 2SC2712-YG				
Q352	8-729-230-49	TRANSISTOR 2SC2712-YG				
		<RESISTOR>				
R1	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R2	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R3	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R4	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R6	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R7	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R8	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R11	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R12	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R13	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R14	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R15	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R16	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R17	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R18	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R19	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R20	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R21	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R22	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R23	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R24	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R25	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R26	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R27	1-216-037-00	METAL GLAZE	330	5%	1/10W	
R29	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R30	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R31	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R32	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R33	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R34	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R38	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R39	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R40	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R41	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R42	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R43	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R44	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R45	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R46	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R47	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R48	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R49	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R50	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R51	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R52	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R53	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R54	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R55	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R56	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R57	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R58	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R59	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R60	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R61	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R63	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R64	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R65	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R66	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R67	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R68	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R69	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R70	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R71	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R72	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R73	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R74	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R75	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R76	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R77	1-216-683-11	METAL CHIP	22K	0.50%	1/10W	
R78	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R80	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R81	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R82	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R83	1-216-031-00	METAL GLAZE	180	5%	1/10W	
R84	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R85	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R86	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R87	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W	
R88	1-216-085-00	METAL GLAZE	33K	5%	1/10W	
R89	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R90	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R91	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R92	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R93	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R94	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R95	1-216-641-11	METAL CHIP	390	0.50%	1/10W	
R101	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R102	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R103	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R104	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R105	1-216-066-00	METAL GLAZE	5.1K	5%	1/10W	
R106	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R107	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R108	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R116	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R117	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R118	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R119	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R120	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R121	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R122	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R123	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	
R124	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R125	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R126	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R127	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R128	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R129	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R130	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R131	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W	
R132	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W	

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REF.NO.	PART NO.	DESCRIPTION	REMARK
R133	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R134	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R135	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R141	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R142	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R143	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R145	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R146	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R148	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R149	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R150	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R201	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R202	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R203	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R204	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R205	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R206	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R207	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R208	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R209	1-216-013-00	METAL GLAZE 33 5% 1/10W	
R210	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R211	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R212	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R213	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R214	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R215	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R216	1-216-013-00	METAL GLAZE 33 5% 1/10W	
R217	1-216-665-11	METAL CHIP 3.9K 0.50% 1/10W	
R218	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R219	1-216-023-00	METAL GLAZE 82 5% 1/10W	
R220	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R221	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R222	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R223	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R224	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R225	1-216-075-00	METAL GLAZE 12K 5% 1/10W	
R226	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R227	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R228	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R229	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R230	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R231	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R232	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R233	1-216-641-11	METAL CHIP 390 0.50% 1/10W	
R234	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R235	1-216-075-00	METAL GLAZE 12K 5% 1/10W	
R236	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R237	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R238	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R239	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R240	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R241	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R242	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R244	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R290	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R301	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R302	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R303	1-216-643-11	METAL CHIP 470 0.50% 1/10W	
R304	1-216-119-00	METAL GLAZE 820K 5% 1/10W	
R305	1-216-005-00	METAL GLAZE 15 5% 1/10W	
R306	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R307	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R308	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R309	1-216-037-00	METAL GLAZE 330 5% 1/10W	

REF.NO.	PART NO.	DESCRIPTION	REMARK
R310	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R311	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R312	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R313	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R314	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R315	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R316	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R317	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R318	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R319	1-216-017-00	METAL GLAZE 47 5% 1/10W	
R320	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R321	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R322	1-216-689-11	METAL CHIP 39K 0.50% 1/10W	
R323	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R324	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R325	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R326	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R327	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R328	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R329	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R330	1-216-683-11	METAL CHIP 22K 0.50% 1/10W	
R331	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R332	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R333	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R334	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R335	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R336	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R337	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R338	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R339	1-216-017-00	METAL GLAZE 47 5% 1/10W	
R340	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R341	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R342	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R343	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R344	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R345	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R346	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R347	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R348	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R349	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R350	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R351	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R352	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R353	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R354	1-216-001-00	METAL GLAZE 10 5% 1/10W	
R355	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R356	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R357	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R358	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R359	1-216-017-00	METAL GLAZE 47 5% 1/10W	
R360	1-216-095-00	METAL GLAZE 82K 5% 1/10W	
R361	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R362	1-216-075-00	METAL GLAZE 12K 5% 1/10W	
R363	1-216-023-00	METAL GLAZE 82 5% 1/10W	
R364	1-216-667-11	METAL CHIP 4.7K 0.50% 1/10W	
R365	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R366	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R367	1-216-681-11	METAL CHIP 18K 0.50% 1/10W	
R368	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R369	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R370	1-216-627-11	METAL CHIP 100 0.50% 1/10W	
R371	1-216-665-11	METAL CHIP 3.9K 0.50% 1/10W	
R372	1-216-627-11	METAL CHIP 100 0.50% 1/10W	

BA **BB**

REF.NO.	PART NO.	DESCRIPTION				REMARK
R373	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R374	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R375	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R376	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R377	1-216-083-00	METAL GLAZE	27K	5%	1/10W	
R378	1-216-091-00	METAL GLAZE	56K	5%	1/10W	
R379	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R380	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R381	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W	
R382	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R383	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R384	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R385	1-216-681-11	METAL CHIP	18K	0.50%	1/10W	
R386	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R387	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R388	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R389	1-216-635-11	METAL CHIP	220	0.50%	1/10W	
R390	1-216-045-00	METAL GLAZE	680	5%	1/10W	
R391	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R392	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R393	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R394	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R395	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R396	1-216-055-00	METAL GLAZE	1.8K	5%	1/10W	
R397	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R398	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R399	1-216-013-00	METAL GLAZE	33	5%	1/10W	
R410	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R411	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R412	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R415	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R416	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R417	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R418	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R419	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R420	1-216-085-00	METAL GLAZE	33K	5%	1/10W	

<VARIABLE RESISTOR>

RV101	1-230-504-11	RES, ADJ, CARBON 220
RV102	1-228-993-00	RES, ADJ, CARBON 4.7K
RV103	1-228-997-00	RES, ADJ, METAL GLAZE 100K
RV104	1-228-997-00	RES, ADJ, METAL GLAZE 100K
RV105	1-228-993-00	RES, ADJ, CARBON 4.7K

<THERMISTER>

TH101	1-800-071-XX	THERMISTER

<CRYSTAL>

X101	1-567-413-11	VIBRATOR, CRYSTAL
X102	1-527-789-00	VINRATOR, CRYSTAL

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*A-1135-693-A BB BOARD, COMPLETE
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*1-564-595-11	PLUG, CONNECTOR 14P
*1-568-984-11	CONNECTOR, MALE 96P
4-382-854-11	SCREW (M3X10), P, SW (+)

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C402	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C404	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C405	1-126-101-11	ELECT	100MF	20%	16V	
C406	1-124-120-11	ELECT	220MF	20%	16V	
C407	1-126-101-11	ELECT	100MF	20%	16V	
C408	1-124-907-11	ELECT	10MF	20%	50V	
C409	1-126-101-11	ELECT	100MF	20%	16V	
C412	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C413	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C414	1-124-907-11	ELECT	10MF	20%	50V	
C415	1-126-101-11	ELECT	100MF	20%	16V	
C416	1-126-101-11	ELECT	100MF	20%	16V	
C417	1-124-120-11	ELECT	220MF	20%	16V	
C418	1-126-101-11	ELECT	100MF	20%	16V	
C419	1-126-101-11	ELECT	100MF	20%	16V	
C425	1-126-101-11	ELECT	100MF	20%	16V	
C450	1-163-113-00	CERAMIC CHIP	68PF	5%	50V	
C451	1-126-103-11	ELECT	470MF	20%	16V	
C453	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C501	1-124-907-11	ELECT	10MF	20%	50V	
C502	1-124-907-11	ELECT	10MF	20%	50V	
C503	1-124-477-11	ELECT	47MF	20%	16V	
C504	1-124-477-11	ELECT	47MF	20%	16V	
C505	1-124-927-11	ELECT	4.7MF	20%	50V	
C506	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C507	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C508	1-124-477-11	ELECT	47MF	20%	16V	
C509	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	
C510	1-124-477-11	ELECT	47MF	20%	16V	
C511	1-126-103-11	ELECT	470MF	20%	16V	
C512	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C513	1-124-477-11	ELECT	47MF	20%	16V	
C514	1-124-927-11	ELECT	4.7MF	20%	50V	
C515	1-124-927-11	ELECT	4.7MF	20%	50V	
C516	1-124-927-11	ELECT	4.7MF	20%	50V	
C518	1-124-907-11	ELECT	10MF	20%	50V	
C519	1-124-907-11	ELECT	10MF	20%	50V	
C520	1-124-903-11	ELECT	1MF	20%	50V	
C521	1-124-907-11	ELECT	10MF	20%	50V	
C522	1-124-907-11	ELECT	10MF	20%	50V	
C523	1-163-833-00	CERAMIC CHIP	0.068MF		25V	
C524	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C525	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C526	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C527	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C528	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	
C529	1-126-233-11	ELECT	22MF	20%	50V	
C650	1-124-657-00	ELECT	10MF	20%	50V	
C651	1-136-169-00	FILM	0.22MF	5%	50V	
C652	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C653	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C654	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C655	1-124-910-11	ELECT	47MF	20%	50V	
C657	1-126-103-11	ELECT	470MF	20%	16V	
C658	1-124-122-11	ELECT	100MF	20%	50V	
C660	1-124-907-11	ELECT	10MF	20%	50V	
C692	1-124-122-11	ELECT	100MF	20%	50V	
C693	1-124-122-11	ELECT	100MF	20%	50V	
C694	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C695	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C696	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C697	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C700	1-124-657-00	ELECT	10MF	20%	50V	
C701	1-136-169-00	FILM	0.22MF	5%	50V	

BB

REF.NO.	PART NO.	DESCRIPTION				REMARK
C702	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C703	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C707	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C708	1-124-910-11	ELECT	47MF	20%	50V	
C710	1-124-122-11	ELECT	100MF	20%	50V	
C711	1-126-103-11	ELECT	470MF	20%	16V	
C713	1-124-907-11	ELECT	10MF	20%	50V	
C750	1-124-657-00	ELECT	10MF	20%	50V	
C751	1-136-169-00	FILM	0.22MF	5%	50V	
C752	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C753	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C754	1-126-101-11	ELECT	100MF	20%	16V	
C755	1-126-101-11	ELECT	100MF	20%	16V	
C756	1-126-101-11	ELECT	100MF	20%	16V	
C757	1-124-910-11	ELECT	47MF	20%	50V	
C759	1-124-122-11	ELECT	100MF	20%	50V	
C760	1-126-103-11	ELECT	470MF	20%	16V	
C762	1-126-233-11	ELECT	22MF	20%	50V	
C763	1-124-907-11	ELECT	10MF	20%	50V	
C914	1-126-101-11	ELECT	100MF	20%	16V	

<DIODE>

REF.NO.	PART NO.	DESCRIPTION	REMARK
D401	8-719-900-95	DIODE V09G	
D402	8-719-900-95	DIODE V09G	
D450	8-719-400-18	DIODE MA152WK	
D451	8-719-400-18	DIODE MA152WK	
D452	8-719-105-28	DIODE RD2.4M-B	
D501	8-719-400-18	DIODE MA152WK	
D502	8-719-400-18	DIODE MA152WK	
D503	8-719-400-18	DIODE MA152WK	
D504	8-719-105-82	DIODE RD5.1M-B2	
D506	8-719-105-82	DIODE RD5.1M-B2	
D507	8-719-105-82	DIODE RD5.1M-B2	
D508	8-719-105-82	DIODE RD5.1M-B2	
D509	8-719-105-82	DIODE RD5.1M-B2	
D510	8-719-105-82	DIODE RD5.1M-B2	
D511	8-719-105-82	DIODE RD5.1M-B2	
D512	8-719-105-82	DIODE RD5.1M-B2	
D513	8-719-105-82	DIODE RD5.1M-B2	
D514	8-719-105-82	DIODE RD5.1M-B2	
D515	8-719-105-82	DIODE RD5.1M-B2	
D516	8-719-106-80	DIODE RD13M-B2	
D518	8-719-106-80	DIODE RD13M-B2	
D520	8-719-105-82	DIODE RD5.1M-B2	
D521	8-719-105-82	DIODE RD5.1M-B2	
D522	8-719-106-80	DIODE RD13M-B2	
D523	8-719-106-80	DIODE RD13M-B2	
D524	8-719-105-82	DIODE RD5.1M-B2	
D525	8-719-105-28	DIODE RD2.4M-B	
D526	8-719-400-18	DIODE MA152WK	
D527	8-719-105-82	DIODE RD5.1M-B2	
D528	8-719-400-18	DIODE MA152WK	
D529	8-719-105-46	DIODE RD3.3M-B2	
D530	8-719-400-18	DIODE MA152WK	
D634	8-719-400-18	DIODE MA152WK	
D652	8-719-400-18	DIODE MA152WK	
D653	8-719-400-18	DIODE MA152WK	

<IC>

REF.NO.	PART NO.	DESCRIPTION	REMARK
IC401	8-759-800-81	IC LA7016	
IC402	8-759-929-62	IC LM7812CT	
IC403	8-759-929-65	IC LM7912CT	
IC404	8-759-009-07	IC MC14053BF	
IC405	8-759-926-18	IC SN74HC157ANS	
IC407	8-759-926-18	IC SN74HC157ANS	
IC408	8-759-300-71	IC HD14053BFP	
IC409	8-759-300-71	IC HD14053BFP	
IC410	8-759-100-96	IC UPC4558G2	
IC411	8-759-100-96	IC UPC4558G2	
IC412	8-759-145-27	IC UPC1406HA	
IC413	8-749-922-84	IC BX-6474	
IC414	8-749-922-83	IC BX-6473	
IC415	8-749-922-83	IC BX-6473	
IC416	8-749-922-83	IC BX-6473	
IC417	8-749-922-86	IC BX-7913	
IC418	8-749-922-85	IC BX-6475	
IC419	8-749-922-85	IC BX-6475	
IC420	8-749-922-85	IC BX-6475	
IC422	8-759-100-93	IC UPC393G2	
IC423	8-759-925-85	IC SN74HC32ANS	
IC424	8-759-100-93	IC UPC393G2	

<JACK>

REF.NO.	PART NO.	DESCRIPTION	REMARK
J101	1-566-980-21	CONNECTOR, ROUND TYPE 4P	
J102	1-537-257-11	TERMINAL BOARD, INPUT/OUTPUT	
J103	1-537-403-11	TERMINAL BOARD, INPUT/OUTPUT	

<COIL>

REF.NO.	PART NO.	DESCRIPTION		REMARK
L401	1-459-155-00	COIL (WITH CORE)	45UH	
L402	1-459-155-00	COIL (WITH CORE)	45UH	
L403	1-459-155-00	COIL (WITH CORE)	45UH	
L404	1-459-155-00	COIL (WITH CORE)	45UH	
L405	1-410-671-31	INDUCTOR	47UH	
L605	1-410-482-31	INDUCTOR	100UH	
L651	1-410-482-31	INDUCTOR	100UH	

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q401	8-729-140-96	TRANSISTOR 2SD774-34	
Q402	8-729-140-97	TRANSISTOR 2SB734-34	
Q403	8-729-901-01	TRANSISTOR DTC144EK	
Q404	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q405	8-729-901-01	TRANSISTOR DTC144EK	
Q450	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q451	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q452	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q453	8-729-901-01	TRANSISTOR DTC144EK	
Q454	8-729-901-01	TRANSISTOR DTC144EK	
Q456	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q457	8-729-216-22	TRANSISTOR 2SA1162-G	
Q501	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q502	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q503	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q504	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q506	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q507	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q508	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q509	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q510	8-729-901-01	TRANSISTOR DTC144EK	
Q511	8-729-901-01	TRANSISTOR DTC144EK	
Q512	8-729-901-01	TRANSISTOR DTC144EK	
Q513	8-729-901-01	TRANSISTOR DTC144EK	
Q514	8-729-901-01	TRANSISTOR DTC144EK	
Q515	8-729-230-49	TRANSISTOR 2SC2712-YG	

BB

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q516	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q517	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q518	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q519	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q520	8-729-901-01	TRANSISTOR DTC144EK	
Q521	8-729-901-01	TRANSISTOR DTC144EK	
Q522	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q523	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q524	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q525	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q526	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q527	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q528	8-729-901-01	TRANSISTOR DTC144EK	
Q529	8-729-901-01	TRANSISTOR DTC144EK	
Q530	8-729-901-01	TRANSISTOR DTC144EK	
Q531	8-729-901-01	TRANSISTOR DTC144EK	
Q532	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q533	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q534	8-729-320-62	TRANSISTOR 2SD789-34	
Q535	8-729-901-01	TRANSISTOR DTC144EK	
Q536	8-729-901-01	TRANSISTOR DTC144EK	
Q537	8-729-901-01	TRANSISTOR DTC144EK	
Q538	8-729-901-01	TRANSISTOR DTC144EK	
Q539	8-729-901-01	TRANSISTOR DTC144EK	
Q540	8-729-901-01	TRANSISTOR DTC144EK	
Q541	8-729-901-01	TRANSISTOR DTC144EK	
Q542	8-729-901-01	TRANSISTOR DTC144EK	
Q543	8-729-901-01	TRANSISTOR DTC144EK	
Q544	8-729-901-01	TRANSISTOR DTC144EK	
Q545	8-729-216-22	TRANSISTOR 2SA1162-G	
Q546	8-729-901-01	TRANSISTOR DTC144EK	
Q547	8-729-216-22	TRANSISTOR 2SA1162-G	
Q548	8-729-901-01	TRANSISTOR DTC144EK	
Q549	8-729-901-01	TRANSISTOR DTC144EK	
Q550	8-729-901-01	TRANSISTOR DTC144EK	
Q551	8-729-901-01	TRANSISTOR DTC144EK	
Q552	8-729-901-01	TRANSISTOR DTC144EK	
Q553	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q650	8-729-116-05	TRANSISTOR 2SK160-K5	
Q651	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q652	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q653	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q654	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q656	8-729-901-01	TRANSISTOR DTC144EK	
Q700	8-729-116-05	TRANSISTOR 2SK160-K5	
Q701	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q702	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q703	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q704	8-729-923-06	TRANSISTOR FMW-8	
Q705	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q706	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q707	8-729-923-06	TRANSISTOR FMW-8	
Q708	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q709	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q710	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q741	8-729-901-01	TRANSISTOR DTC144EK	
Q750	8-729-116-05	TRANSISTOR 2SK160-K5	
Q751	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q752	8-729-112-65	TRANSISTOR 2SA1462-Y33	
Q753	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q754	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q755	8-729-107-31	TRANSISTOR 2SC3545-T43	
Q756	8-729-901-01	TRANSISTOR DTC144EK	
Q757	8-729-107-31	TRANSISTOR 2SC3545-T43	

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q800	8-729-230-49	TRANSISTOR 2SC2712-YG	
		<RESISTOR>	
R401	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R403	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R404	1-216-693-11	METAL CHIP 56K 0.50% 1/10W	
R405	1-216-691-11	METAL CHIP 47K 0.50% 1/10W	
R450	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R451	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R452	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R453	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R454	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R455	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R456	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R459	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R460	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R461	1-216-017-00	METAL GLAZE 47 5% 1/10W	
R462	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R463	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R464	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R466	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R467	1-216-651-11	METAL CHIP 1K 0.50% 1/10W	
R468	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R469	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R470	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R471	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R472	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R473	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R474	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R501	1-216-624-11	METAL CHIP 75 0.50% 1/10W	
R502	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R503	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R504	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R505	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	
R506	1-216-624-11	METAL CHIP 75 0.50% 1/10W	
R507	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R508	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R509	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R510	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R511	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R512	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R513	1-216-077-00	METAL GLAZE 15K 5% 1/10W	
R514	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R516	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R518	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R519	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R520	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R521	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R522	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R523	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R524	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R525	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R526	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R527	1-216-041-00	METAL GLAZE 470 5% 1/10W	
R528	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R529	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R530	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R531	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R532	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R533	1-216-659-11	METAL CHIP 2.2K 0.50% 1/10W	
R534	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R535	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R536	1-216-025-00	METAL GLAZE 100 5% 1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R537	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R538	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R539	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R540	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R541	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R542	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W	
R543	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R544	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R545	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R546	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R547	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R548	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R549	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R550	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R551	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R552	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R553	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R554	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R555	1-216-047-00	METAL GLAZE	820	5%	1/10W	
R556	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R557	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R558	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R559	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R560	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R561	1-216-691-11	METAL CHIP	47K	0.50%	1/10W	
R562	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R563	1-216-035-00	METAL GLAZE	270	5%	1/10W	
R564	1-216-043-00	METAL GLAZE	560	5%	1/10W	
R565	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R566	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R567	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R568	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R569	1-216-295-00	METAL GLAZE	0	5%	1/10W	
R570	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R571	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R572	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R573	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R574	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R575	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R576	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R577	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R578	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R579	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R580	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R581	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R582	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R583	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R584	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R585	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R586	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R587	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R588	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R589	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R590	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R591	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R592	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R593	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W	
R594	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R595	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R596	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R597	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R598	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R599	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R600	1-216-025-00	METAL GLAZE	100	5%	1/10W	

REF.NO.	PART NO.	DESCRIPTION				REMARK
R601	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R602	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R603	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R604	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W	
R605	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R606	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R607	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R608	1-216-075-00	METAL GLAZE	12K	5%	1/10W	
R609	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R610	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R611	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R612	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R613	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R614	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R615	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R616	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R617	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R618	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R619	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R620	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R621	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R622	1-216-448-11	METAL OXIDE	39	5%	2W	F
R623	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R624	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R625	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R626	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R627	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R628	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R629	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R630	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R631	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R632	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R633	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R634	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R635	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R636	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R637	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R638	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R639	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R640	1-216-077-00	METAL GLAZE	15K	5%	1/10W	
R641	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R642	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R643	1-216-097-00	METAL GLAZE	100K	5%	1/10W	
R650	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R651	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R652	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R653	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R654	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R655	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R656	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R657	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R658	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R659	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R660	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R661	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R663	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R664	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R665	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R686	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R688	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R700	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R701	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R702	1-216-081-00	METAL GLAZE	22K	5%	1/10W	

BB **CA(RG)**

REF.NO.	PART NO.	DESCRIPTION				REMARK
R703	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R704	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R705	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R706	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R707	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R708	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R709	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R710	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R711	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R712	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R713	1-216-651-11	METAL CHIP	1K	0.50%	1/10W	
R714	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R715	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R716	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R717	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R718	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R719	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R720	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W	
R721	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R722	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R723	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R724	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R725	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R727	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R728	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R729	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R750	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R751	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R752	1-216-081-00	METAL GLAZE	22K	5%	1/10W	
R753	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R755	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R756	1-216-121-00	METAL GLAZE	1M	5%	1/10W	
R757	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R758	1-216-627-11	METAL CHIP	100	0.50%	1/10W	
R759	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W	
R760	1-216-665-11	METAL CHIP	3.9K	0.50%	1/10W	
R761	1-216-643-11	METAL CHIP	470	0.50%	1/10W	
R762	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W	
R763	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R764	1-216-025-00	METAL GLAZE	100	5%	1/10W	
R765	1-216-624-11	METAL CHIP	75	0.50%	1/10W	
R766	1-216-073-00	METAL GLAZE	10K	5%	1/10W	
R768	1-216-001-00	METAL GLAZE	10	5%	1/10W	
R769	1-216-017-00	METAL GLAZE	47	5%	1/10W	
R770	1-216-049-00	METAL GLAZE	1K	5%	1/10W	
R791	1-216-041-00	METAL GLAZE	470	5%	1/10W	
R836	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R837	1-216-631-11	METAL CHIP	150	0.50%	1/10W	
R900	1-216-049-00	METAL GLAZE	1K	5%	1/10W	

<RELAY>

REF.NO.	PART NO.	DESCRIPTION
RL401	1-515-757-11	RELAY
RL402	1-515-757-11	RELAY
RL403	1-515-757-11	RELAY

<SWITCH>

REF.NO.	PART NO.	DESCRIPTION
SW101	1-570-859-11	SWITCH, SLIDE

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*A-1335-032-A CA (RG) BOARD, COMPLETE
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REF.NO.	PART NO.	DESCRIPTION	REMARK
	*1-526-575-00	SOCKET, PLUG 1P	
	1-564-507-11	PLUG, CONNECTOR 4P	
	*1-564-514-11	PLUG, CONNECTOR 11P	
	*1-564-515-11	PLUG, CONNECTOR 12P	
	*1-564-516-11	PLUG, CONNECTOR 13P	
	*1-568-979-11	CONNECTOR 30P	
	*4-363-404-00	HOLDER, IC	
	4-382-854-11	SCREW (M3X10), P, SW (+)	

<CAPACITOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
C1	1-124-907-11	ELECT	10MF	20%	50V	
C2	1-126-101-11	ELECT	100MF	20%	16V	
C3	1-124-907-11	ELECT	10MF	20%	50V	
C4	1-126-101-11	ELECT	100MF	20%	16V	
C5	1-126-233-11	ELECT	22MF	20%	50V	
C6	1-126-101-11	ELECT	100MF	20%	16V	
C7	1-126-233-11	ELECT	22MF	20%	50V	
C8	1-102-820-00	CERAMIC	330PF	5%	50V	
C9	1-101-880-00	CERAMIC	47PF	5%	50V	
C10	1-101-004-00	CERAMIC	0.01MF		50V	
C11	1-101-004-00	CERAMIC	0.01MF		50V	
C12	1-101-004-00	CERAMIC	0.01MF		50V	
C13	1-101-004-00	CERAMIC	0.01MF		50V	
C14	1-126-233-11	ELECT	22MF	20%	50V	
C16	1-126-233-11	ELECT	22MF	20%	50V	
C17	1-136-165-00	FILM	0.1MF	5%	50V	
C18	1-136-165-00	FILM	0.1MF	5%	50V	
C19	1-136-165-00	FILM	0.1MF	5%	50V	
C20	1-136-165-00	FILM	0.1MF	5%	50V	
C21	1-126-233-11	ELECT	22MF	20%	50V	
C22	1-126-103-11	ELECT	470MF	20%	16V	
C23	1-136-171-00	FILM	0.33MF	5%	50V	
C24	1-102-038-00	CERAMIC	0.001MF		500V	
C25	1-124-907-11	ELECT	10MF	20%	50V	
C26	1-126-101-11	ELECT	100MF	20%	16V	
C101	1-124-282-00	ELECT	22MF	20%	16V	
C102	1-124-477-11	ELECT	47MF	20%	16V	
C103	1-126-101-11	ELECT	100MF	20%	16V	
C104	1-126-101-11	ELECT	100MF	20%	16V	
C105	1-126-233-11	ELECT	22MF	20%	50V	
C106	1-102-973-00	CERAMIC	100PF	5%	50V	
C107	1-102-976-00	CERAMIC	180PF	5%	50V	
C110	1-124-798-11	ELECT	1MF	20%	160V	
C111	1-126-233-11	ELECT	22MF	20%	50V	
C112	1-136-165-00	FILM	0.1MF	5%	50V	
C113	1-136-165-00	FILM	0.1MF	5%	50V	
C114	1-126-174-51	ELECT	10MF	20%	350V	
C115	1-102-038-00	CERAMIC	0.001MF		500V	
C116	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C117	1-124-768-11	ELECT	4.7MF	20%	50V	
C118	1-101-004-00	CERAMIC	0.01MF		50V	
C119	1-136-165-00	FILM	0.1MF	5%	50V	
C120	1-124-903-11	ELECT	1MF	20%	50V	
C121	1-126-233-11	ELECT	22MF	20%	50V	
C122	1-126-233-11	ELECT	22MF	20%	50V	
C123	1-102-050-00	CERAMIC	0.01MF	99%	500V	
C125	1-126-233-11	ELECT	22MF	20%	50V	
C126	1-101-004-00	CERAMIC	0.01MF		50V	
C127	1-101-004-00	CERAMIC	0.01MF		50V	
C201	1-124-282-00	ELECT	22MF	20%	16V	
C202	1-126-233-11	ELECT	22MF	20%	50V	
C203	1-126-101-11	ELECT	100MF	20%	16V	
C204	1-126-101-11	ELECT	100MF	20%	16V	

REF.NO.	PART NO.	DESCRIPTION			REMARK
C205	1-126-233-11	ELECT	22MF	20%	50V
C206	1-102-973-00	CERAMIC	100PF	5%	50V
C207	1-102-976-00	CERAMIC	180PF	5%	50V
C210	1-124-798-11	ELECT	1MF	20%	160V
C211	1-126-233-11	ELECT	22MF	20%	50V
C212	1-136-165-00	FILM	0.1MF	5%	50V
C213	1-136-165-00	FILM	0.1MF	5%	50V
C214	1-126-174-51	ELECT	10MF	20%	350V
C215	1-102-038-00	CERAMIC	0.001MF		500V
C216	1-102-050-00	CERAMIC	0.01MF	99%	500V
C217	1-124-768-11	ELECT	4.7MF	20%	50V
C218	1-101-004-00	CERAMIC	0.01MF		50V
C219	1-136-165-00	FILM	0.1MF	5%	50V
C220	1-124-903-11	ELECT	1MF	20%	50V
C221	1-126-233-11	ELECT	22MF	20%	50V
C222	1-126-233-11	ELECT	22MF	20%	50V
C223	1-102-050-00	CERAMIC	0.01MF	99%	500V
C225	1-126-233-11	ELECT	22MF	20%	50V
C226	1-101-004-00	CERAMIC	0.01MF		50V
C227	1-101-004-00	CERAMIC	0.01MF		50V

<DIODE>

REF.NO.	PART NO.	DESCRIPTION
D1	8-719-900-95	DIODE V09G
D2	8-719-900-95	DIODE V09G
D3	8-719-109-85	DIODE RD5.1ESB2
D4	8-719-911-19	DIODE 1SS119
D7	8-719-911-19	DIODE 1SS119
D8	8-719-911-19	DIODE 1SS119
D9	8-719-109-97	DIODE RD6.8ESB2
D12	8-719-911-19	DIODE 1SS119
D13	8-719-109-85	DIODE RD5.1ESB2
D14	8-719-109-97	DIODE RD6.8ESB2
D15	8-719-911-19	DIODE 1SS119
D101	8-719-901-83	DIODE 1SS83
D103	8-719-911-19	DIODE 1SS119
D104	8-719-911-19	DIODE 1SS119
D105	8-719-901-83	DIODE 1SS83
D106	8-719-911-19	DIODE 1SS119
D107	8-719-911-19	DIODE 1SS119
D109	8-719-911-19	DIODE 1SS119
D110	8-719-109-51	DIODE RD2.0ESB2
D111	8-719-911-19	DIODE 1SS119
D112	8-719-911-19	DIODE 1SS119
D113	8-719-911-19	DIODE 1SS119
D114	8-719-110-36	DIODE RD13ESB2
D115	8-719-911-19	DIODE 1SS119
D117	8-719-911-19	DIODE 1SS119
D118	8-719-911-19	DIODE 1SS119
D120	8-719-911-19	DIODE 1SS119
D121	8-719-911-19	DIODE 1SS119
D122	8-719-911-19	DIODE 1SS119
D201	8-719-901-83	DIODE 1SS83
D203	8-719-911-19	DIODE 1SS119
D204	8-719-911-19	DIODE 1SS119
D205	8-719-901-83	DIODE 1SS83
D206	8-719-911-19	DIODE 1SS119
D207	8-719-911-19	DIODE 1SS119
D209	8-719-911-19	DIODE 1SS119
D210	8-719-109-51	DIODE RD2.0ESB2
D211	8-719-911-19	DIODE 1SS119
D212	8-719-911-19	DIODE 1SS119
D213	8-719-911-19	DIODE 1SS119
D214	8-719-110-36	DIODE RD13ESB2

REF.NO.	PART NO.	DESCRIPTION	REMARK
D217	8-719-911-19	DIODE 1SS119	
D218	8-719-911-19	DIODE 1SS119	

<IC>

REF.NO.	PART NO.	DESCRIPTION
IC1	8-759-929-65	IC LM7912CT
IC2	8-759-929-62	IC LM7812CT
IC3	8-759-708-05	IC NJM78L05A
IC4	8-759-000-01	IC MC74HC4538AN
IC5	8-759-984-55	IC MB675429
IC6	8-759-916-71	IC MC74HC244AN
IC7	8-759-916-12	IC MC74HC00AN
IC8	8-759-990-82	IC TL082CP
IC101	8-749-922-43	IC VPH05A
IC102	8-759-990-82	IC TL082CP
IC104	8-749-923-15	IC TY885002A
IC201	8-749-922-43	IC VPH05A
IC202	8-759-990-82	IC TL082CP
IC204	8-749-923-15	IC TY885002A

<COIL>

REF.NO.	PART NO.	DESCRIPTION	
L101	1-408-879-21	INDUCTOR	0.47UH
L201	1-408-879-21	INDUCTOR	0.47UH

<TRANSISTOR>

REF.NO.	PART NO.	DESCRIPTION
Q1	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q2	8-729-900-89	TRANSISTOR DTC144ES
Q3	8-729-900-89	TRANSISTOR DTC144ES
Q4	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q5	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q8	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q9	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q10	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q11	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q12	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q14	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q15	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q16	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q17	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q18	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q19	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q101	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q102	8-729-140-50	TRANSISTOR 2SC3209LK
Q103	8-729-801-88	TRANSISTOR 2SA1381-E
Q104	8-729-801-88	TRANSISTOR 2SA1381-E
Q105	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q106	8-729-140-50	TRANSISTOR 2SC3209LK
Q107	8-729-801-88	TRANSISTOR 2SA1381-E
Q108	8-729-900-65	TRANSISTOR DTA144ES
Q109	8-729-900-65	TRANSISTOR DTA144ES
Q110	8-729-900-89	TRANSISTOR DTC144ES
Q111	8-729-105-74	TRANSISTOR 2SK523-M1
Q112	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q113	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q115	8-729-801-88	TRANSISTOR 2SA1381-E
Q201	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q202	8-729-140-50	TRANSISTOR 2SC3209LK
Q203	8-729-801-88	TRANSISTOR 2SA1381-E
Q204	8-729-801-88	TRANSISTOR 2SA1381-E
Q205	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q206	8-729-140-50	TRANSISTOR 2SC3209LK
Q207	8-729-801-88	TRANSISTOR 2SA1381-E

CA(RG)

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q208	8-729-900-65	TRANSISTOR DTA144ES	
Q209	8-729-900-65	TRANSISTOR DTA144ES	
Q210	8-729-900-89	TRANSISTOR DTC144ES	
Q211	8-729-105-74	TRANSISTOR 2SK523-M1	
Q212	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q215	8-729-801-88	TRANSISTOR 2SA1381-E	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R1	1-249-405-11	CARBON	100	5%	1/4W	
R2	1-215-437-00	METAL	4.7K	1%	1/4W	
R3	1-249-441-11	CARBON	100K	5%	1/4W	
R4	1-215-449-00	METAL	15K	1%	1/4W	
R5	1-249-405-11	CARBON	100	5%	1/4W	
R6	1-249-438-11	CARBON	56K	5%	1/4W	
R7	1-249-437-11	CARBON	47K	5%	1/4W	
R8	1-249-405-11	CARBON	100	5%	1/4W	
R9	1-215-449-00	METAL	15K	1%	1/4W	
R10	1-215-447-00	METAL	12K	1%	1/4W	
R11	1-249-405-11	CARBON	100	5%	1/4W	
R12	1-249-405-11	CARBON	100	5%	1/4W	
R14	1-249-427-11	CARBON	6.8K	5%	1/4W	
R15	1-249-429-11	CARBON	10K	5%	1/4W	
R16	1-249-405-11	CARBON	100	5%	1/4W	
R17	1-249-423-11	CARBON	3.3K	5%	1/4W	
R18	1-249-426-11	CARBON	5.6K	5%	1/4W	
R19	1-215-413-00	METAL	470	1%	1/4W	
R20	1-215-455-00	METAL	27K	1%	1/4W	
R22	1-215-443-00	METAL	8.2K	1%	1/4W	
R23	1-215-447-00	METAL	12K	1%	1/4W	
R24	1-215-453-00	METAL	22K	1%	1/4W	
R25	1-215-457-00	METAL	33K	1%	1/4W	
R26	1-249-405-11	CARBON	100	5%	1/4W	
R27	1-249-405-11	CARBON	100	5%	1/4W	
R28	1-215-431-00	METAL	2.7K	1%	1/4W	
R29	1-249-429-11	CARBON	10K	5%	1/4W	
R30	1-215-469-00	METAL	100K	1%	1/4W	
R31	1-249-429-11	CARBON	10K	5%	1/4W	
R32	1-215-443-00	METAL	8.2K	1%	1/4W	
R33	1-215-443-00	METAL	8.2K	1%	1/4W	
R34	1-215-443-00	METAL	8.2K	1%	1/4W	
R35	1-247-887-00	CARBON	220K	5%	1/4W	
R36	1-247-887-00	CARBON	220K	5%	1/4W	
R37	1-247-887-00	CARBON	220K	5%	1/4W	
R38	1-249-441-11	CARBON	100K	5%	1/4W	
R39	1-215-469-00	METAL	100K	1%	1/4W	
R40	1-249-433-11	CARBON	22K	5%	1/4W	
R41	1-215-473-00	METAL	150K	1%	1/4W	
R42	1-249-433-11	CARBON	22K	5%	1/4W	
R43	1-249-405-11	CARBON	100	5%	1/4W	
R44	1-249-429-11	CARBON	10K	5%	1/4W	
R45	1-249-429-11	CARBON	10K	5%	1/4W	
R46	1-247-887-00	CARBON	220K	5%	1/4W	
R47	1-249-413-11	CARBON	470	5%	1/4W	
R48	1-249-439-11	CARBON	68K	5%	1/4W	
R101	1-215-401-11	METAL	150	1%	1/4W	
R102	1-215-401-11	METAL	150	1%	1/4W	
R103	1-215-473-00	METAL	150K	1%	1/4W	
R105	1-215-469-00	METAL	100K	1%	1/4W	
R106	1-215-465-00	METAL	68K	1%	1/4W	
R107	1-249-421-11	CARBON	2.2K	5%	1/4W	
R108	1-249-403-11	CARBON	68	5%	1/4W	F
R109	1-215-429-00	METAL	2.2K	1%	1/4W	
R110	1-249-413-11	CARBON	470	5%	1/4W	F
R111	1-249-421-11	CARBON	2.2K	5%	1/4W	
R112	1-215-383-00	METAL	27	1%	1/4W	
R117	1-249-421-11	CARBON	2.2K	5%	1/4W	
R118	1-215-447-00	METAL	12K	1%	1/4W	
R119	1-215-433-00	METAL	3.3K	1%	1/4W	
R120	1-215-433-00	METAL	3.3K	1%	1/4W	
R122	1-215-441-00	METAL	6.8K	1%	1/4W	
R123	1-215-481-00	METAL	330K	1%	1/4W	
R124	1-215-433-00	METAL	3.3K	1%	1/4W	
R125	1-249-431-11	CARBON	15K	5%	1/4W	
R126	1-249-431-11	CARBON	15K	5%	1/4W	
R127	1-249-415-11	CARBON	680	5%	1/4W	
R128	1-249-405-11	CARBON	100	5%	1/4W	
R129	1-249-414-11	CARBON	560	5%	1/4W	F
R130	1-215-431-00	METAL	2.7K	1%	1/4W	
R131	1-202-549-00	SOLID	100	10%	1/2W	
R132	1-202-549-00	SOLID	100	10%	1/2W	
R133	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R134	1-249-429-11	CARBON	10K	5%	1/4W	
R135	1-215-469-00	METAL	100K	1%	1/4W	
R136	1-214-777-00	METAL	100K	1%	1/4W	
R137	1-215-445-00	METAL	10K	1%	1/4W	
R138	1-215-451-00	METAL	18K	1%	1/4W	
R139	1-249-421-11	CARBON	2.2K	5%	1/4W	
R140	1-215-453-00	METAL	22K	1%	1/4W	
R141	1-215-421-00	METAL	1K	1%	1/4W	
R142	1-249-417-11	CARBON	1K	5%	1/4W	
R143	1-247-903-00	CARBON	1M	5%	1/4W	
R144	1-249-427-11	CARBON	6.8K	5%	1/4W	
R145	1-249-405-11	CARBON	100	5%	1/4W	
R147	1-215-457-00	METAL	33K	1%	1/4W	
R148	1-249-410-11	CARBON	270	5%	1/4W	F
R149	1-249-405-11	CARBON	100	5%	1/4W	
R150	1-249-405-11	CARBON	100	5%	1/4W	
R160	1-249-423-11	CARBON	3.3K	5%	1/4W	
R201	1-215-401-11	METAL	150	1%	1/4W	
R202	1-215-401-11	METAL	150	1%	1/4W	
R203	1-215-461-00	METAL	47K	1%	1/4W	
R204	1-215-469-00	METAL	100K	1%	1/4W	
R205	1-215-469-00	METAL	100K	1%	1/4W	
R206	1-215-471-00	METAL	120K	1%	1/4W	
R207	1-249-421-11	CARBON	2.2K	5%	1/4W	
R208	1-249-403-11	CARBON	68	5%	1/4W	F
R209	1-215-429-00	METAL	2.2K	1%	1/4W	
R210	1-249-410-11	CARBON	270	5%	1/4W	F
R211	1-249-421-11	CARBON	2.2K	5%	1/4W	
R212	1-215-383-00	METAL	27	1%	1/4W	
R217	1-249-421-11	CARBON	2.2K	5%	1/4W	
R218	1-215-447-00	METAL	12K	1%	1/4W	
R219	1-215-433-00	METAL	3.3K	1%	1/4W	
R220	1-215-433-00	METAL	3.3K	1%	1/4W	
R222	1-215-441-00	METAL	6.8K	1%	1/4W	
R223	1-215-481-00	METAL	330K	1%	1/4W	
R224	1-215-433-00	METAL	3.3K	1%	1/4W	
R225	1-249-431-11	CARBON	15K	5%	1/4W	
R226	1-249-431-11	CARBON	15K	5%	1/4W	
R227	1-249-415-11	CARBON	680	5%	1/4W	
R228	1-249-405-11	CARBON	100	5%	1/4W	
R229	1-249-414-11	CARBON	560	5%	1/4W	F
R230	1-215-431-00	METAL	2.7K	1%	1/4W	
R231	1-202-549-00	SOLID	100	10%	1/2W	
R232	1-202-549-00	SOLID	100	10%	1/2W	
R233	1-249-421-11	CARBON	2.2K	5%	1/4W	F

REF.NO.	PART NO.	DESCRIPTION				REMARK
R234	1-215-469-00	METAL	100K	1%	1/4W	
R235	1-249-429-11	CARBON	10K	5%	1/4W	
R236	1-214-777-00	METAL	100K	1%	1/4W	
R237	1-215-445-00	METAL	10K	1%	1/4W	
R238	1-215-451-00	METAL	18K	1%	1/4W	
R239	1-249-421-11	CARBON	2.2K	5%	1/4W	
R240	1-215-453-00	METAL	22K	1%	1/4W	
R241	1-215-421-00	METAL	1K	1%	1/4W	
R242	1-249-417-11	CARBON	1K	5%	1/4W	
R243	1-247-903-00	CARBON	1M	5%	1/4W	
R244	1-249-427-11	CARBON	6.8K	5%	1/4W	
R245	1-249-405-11	CARBON	100	5%	1/4W	
R247	1-249-405-11	CARBON	100	5%	1/4W	
R248	1-249-405-11	CARBON	100	5%	1/4W	
R260	1-249-423-11	CARBON	3.3K	5%	1/4W	

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	*A-1335-033-A	CA (B) BOARD, COMPLETE **********************
	*1-526-575-00	SOCKET, PLUG 1P
	1-564-507-11	PLUG, CONNECTOR 4P
	*1-564-516-11	PLUG, CONNECTOR 13P

<CAPACITOR>

C30	1-126-101-11	ELECT	100MF	20%	16V
C31	1-126-101-11	ELECT	100MF	20%	16V
C32	1-126-233-11	ELECT	22MF	20%	50V
C33	1-126-233-11	ELECT	22MF	20%	50V
C34	1-101-004-00	CERAMIC	0.01MF		50V
C35	1-124-903-11	ELECT	1MF	20%	50V
C36	1-124-903-11	ELECT	1MF	20%	50V
C37	1-126-233-11	ELECT	22MF	20%	50V
C38	1-101-004-00	CERAMIC	0.01MF		50V
C42	1-162-117-00	CERAMIC	100PF	10%	500V
C43	1-101-004-00	CERAMIC	0.01MF		50V
C44	1-124-798-11	ELECT	1MF	20%	160V
C45	1-101-004-00	CERAMIC	0.01MF		50V
C46	1-126-233-11	ELECT	22MF	20%	50V
C47	1-126-134-11	ELECT	4.7MF	20%	350V
C48	1-123-932-00	ELECT	4.7MF	20%	160V
C50	1-124-798-11	ELECT	1MF	20%	160V
C51	1-102-050-00	CERAMIC	0.01MF	99%	500V
C52	1-102-050-00	CERAMIC	0.01MF	99%	500V
C54	1-124-798-11	ELECT	1MF	20%	160V
C55	1-126-233-11	ELECT	22MF	20%	50V
C56	1-124-903-11	ELECT	1MF	20%	50V
C57	1-124-903-11	ELECT	1MF	20%	50V
C58	1-101-004-00	CERAMIC	0.01MF		50V
C301	1-124-282-00	ELECT	22MF	20%	16V
C302	1-124-910-11	ELECT	47MF	20%	50V
C303	1-126-101-11	ELECT	100MF	20%	16V
C304	1-126-101-11	ELECT	100MF	20%	16V
C305	1-126-233-11	ELECT	22MF	20%	50V
C306	1-102-973-00	CERAMIC	100PF	5%	50V
C307	1-102-976-00	CERAMIC	180PF	5%	50V
C310	1-124-798-11	ELECT	1MF	20%	160V
C311	1-126-233-11	ELECT	22MF	20%	50V
C312	1-136-165-00	FILM	0.1MF	5%	50V
C313	1-136-165-00	FILM	0.1MF	5%	50V
C314	1-126-174-51	ELECT	10MF	20%	350V
C315	1-102-038-00	CERAMIC	0.001MF		500V
C316	1-102-050-00	CERAMIC	0.01MF	99%	500V
C317	1-124-768-11	ELECT	4.7MF	20%	50V

REF.NO.	PART NO.	DESCRIPTION			REMARK
C318	1-101-004-00	CERAMIC	0.01MF		50V
C319	1-136-165-00	FILM	0.1MF	5%	50V
C320	1-124-903-11	ELECT	1MF	20%	50V
C321	1-126-233-11	ELECT	22MF	20%	50V
C322	1-126-233-11	ELECT	22MF	20%	50V
C323	1-102-050-00	CERAMIC	0.01MF	99%	500V
C324	1-102-973-00	CERAMIC	100PF	5%	50V
C325	1-126-233-11	ELECT	22MF	20%	50V
C326	1-101-004-00	CERAMIC	0.01MF		50V
C327	1-101-004-00	CERAMIC	0.01MF		50V
C350	1-126-101-11	ELECT	100MF	20%	16V
C351	1-126-101-11	ELECT	100MF	20%	16V

<DIODE>

D30	8-719-109-66	DIODE RD3.3ESB2
D31	8-719-901-83	DIODE 1SS83
D32	8-719-901-83	DIODE 1SS83
D33	8-719-110-31	DIODE RD12ESB2
D34	8-719-110-31	DIODE RD12ESB2
D35	8-719-900-95	DIODE V09G
D36	8-719-900-95	DIODE V09G
D40	8-719-900-95	DIODE V09G
D41	8-719-911-19	DIODE 1SS119
D301	8-719-901-83	DIODE 1SS83
D303	8-719-911-19	DIODE 1SS119
D304	8-719-911-19	DIODE 1SS119
D305	8-719-901-83	DIODE 1SS83
D306	8-719-911-19	DIODE 1SS119
D307	8-719-911-19	DIODE 1SS119
D309	8-719-911-19	DIODE 1SS119
D310	8-719-109-51	DIODE RD2.0ESB2
D311	8-719-911-19	DIODE 1SS119
D312	8-719-911-19	DIODE 1SS119
D313	8-719-911-19	DIODE 1SS119
D314	8-719-110-36	DIODE RD13ESB2
D315	8-719-109-66	DIODE RD3.3ESB2
D316	8-719-911-19	DIODE 1SS119
D317	8-719-911-19	DIODE 1SS119
D318	8-719-911-19	DIODE 1SS119

<IC>

IC301	8-749-922-43	IC VPH05A
IC302	8-759-990-82	IC TL082CP
IC304	8-749-923-15	IC TY885002A
IC305	8-749-923-25	IC TY911504

<COIL>

L301	1-408-879-21	INDUCTOR	0.47UH

<TRANSISTOR>

Q30	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q31	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q32	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q33	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q34	8-729-119-78	TRANSISTOR 2SC2785-HFE
Q35	8-729-119-76	TRANSISTOR 2SA1175-HFE
Q36	8-729-820-82	TRANSISTOR 2SA1208-S
Q37	8-729-820-82	TRANSISTOR 2SA1208-S
Q38	8-729-255-12	TRANSISTOR 2SC2551-O
Q41	8-729-903-68	TRANSISTOR 2SD982

CA(B)

REF.NO.	PART NO.	DESCRIPTION	REMARK
Q42	8-729-801-88	TRANSISTOR 2SA1381-E	
Q43	8-729-801-88	TRANSISTOR 2SA1381-E	
Q44	8-729-903-68	TRANSISTOR 2SD982	
Q45	8-729-140-50	TRANSISTOR 2SC3209LK	
Q301	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q302	8-729-140-50	TRANSISTOR 2SC3209LK	
Q303	8-729-801-88	TRANSISTOR 2SA1381-E	
Q304	8-729-801-88	TRANSISTOR 2SA1381-E	
Q305	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q306	8-729-140-50	TRANSISTOR 2SC3209LK	
Q307	8-729-801-88	TRANSISTOR 2SA1381-E	
Q308	8-729-900-65	TRANSISTOR DTA144ES	
Q309	8-729-900-65	TRANSISTOR DTA144ES	
Q310	8-729-900-89	TRANSISTOR DTC144ES	
Q311	8-729-105-74	TRANSISTOR 2SK523-M1	
Q312	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q313	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q314	8-729-900-89	TRANSISTOR DTC144ES	
Q315	8-729-801-88	TRANSISTOR 2SA1381-E	

<RESISTOR>

REF.NO.	PART NO.	DESCRIPTION				REMARK
R50	1-249-421-11	CARBON	2.2K	5%	1/4W	
R51	1-249-424-11	CARBON	3.9K	5%	1/4W	
R52	1-249-393-11	CARBON	10	5%	1/4W	
R53	1-249-424-11	CARBON	3.9K	5%	1/4W	
R54	1-215-437-00	METAL	4.7K	1%	1/4W	
R55	1-215-439-00	METAL	5.6K	1%	1/4W	
R56	1-215-467-00	METAL	82K	1%	1/4W	
R57	1-249-405-11	CARBON	100	5%	1/4W	
R58	1-249-405-11	CARBON	100	5%	1/4W	
R59	1-249-423-11	CARBON	3.3K	5%	1/4W	
R60	1-249-405-11	CARBON	100	5%	1/4W	
R61	1-249-423-11	CARBON	3.3K	5%	1/4W	
R62	1-249-425-11	CARBON	4.7K	5%	1/4W	
R63	1-249-437-11	CARBON	47K	5%	1/4W	
R65	1-249-425-11	CARBON	4.7K	5%	1/4W	
R66	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R67	1-249-397-11	CARBON	22	5%	1/4W	
R68	1-249-397-11	CARBON	22	5%	1/4W	F
R74	1-249-429-11	CARBON	10K	5%	1/4W	F
R75	1-249-429-11	CARBON	10K	5%	1/4W	F
R76	1-202-719-00	SOLID	1M	10%	1/2W	
R77	1-247-903-00	CARBON	1M	5%	1/4W	
R79	1-249-397-11	CARBON	22	5%	1/4W	F
R80	1-249-437-11	CARBON	47K	5%	1/4W	
R81	1-249-441-11	CARBON	100K	5%	1/4W	
R82	1-249-437-11	CARBON	47K	5%	1/4W	
R83	1-249-435-11	CARBON	33K	5%	1/4W	
R84	1-249-476-11	CARBON	1.5	5%	1/2W	F
R85	1-249-433-11	CARBON	22K	5%	1/4W	
R86	1-247-903-00	CARBON	1M	5%	1/4W	
R87	1-249-425-11	CARBON	4.7K	5%	1/4W	
R301	1-215-401-11	METAL	150	1%	1/4W	
R302	1-215-401-11	METAL	150	1%	1/4W	
R303	1-215-461-00	METAL	47K	1%	1/4W	
R304	1-215-469-00	METAL	100K	1%	1/4W	
R305	1-215-469-00	METAL	100K	1%	1/4W	
R306	1-215-473-00	METAL	150K	1%	1/4W	
R307	1-249-421-11	CARBON	2.2K	5%	1/4W	
R308	1-249-403-11	CARBON	68	5%	1/4W	
R309	1-215-429-00	METAL	2.2K	1%	1/4W	
R310	1-249-409-11	CARBON	220	5%	1/4W	F
R311	1-249-421-11	CARBON	2.2K	5%	1/4W	
R312	1-215-383-00	METAL	27	1%	1/4W	
R317	1-249-421-11	CARBON	2.2K	5%	1/4W	
R318	1-215-447-00	METAL	12K	1%	1/4W	
R319	1-215-433-00	METAL	3.3K	1%	1/4W	
R320	1-215-433-00	METAL	3.3K	1%	1/4W	
R322	1-215-441-00	METAL	6.8K	1%	1/4W	
R323	1-215-481-00	METAL	330K	1%	1/4W	
R324	1-215-433-00	METAL	3.3K	1%	1/4W	
R325	1-249-431-11	CARBON	15K	5%	1/4W	
R326	1-249-431-11	CARBON	15K	5%	1/4W	
R327	1-249-415-11	CARBON	680	5%	1/4W	
R328	1-249-405-11	CARBON	100	5%	1/4W	
R329	1-249-414-11	CARBON	560	5%	1/4W	F
R330	1-215-431-00	METAL	2.7K	1%	1/4W	
R331	1-202-549-00	SOLID	100	10%	1/2W	
R332	1-202-549-00	SOLID	100	10%	1/2W	
R333	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R334	1-215-469-00	METAL	100K	1%	1/4W	
R335	1-249-429-11	CARBON	10K	5%	1/4W	
R336	1-214-777-00	METAL	100K	1%	1/4W	
R337	1-215-445-00	METAL	10K	1%	1/4W	
R338	1-215-451-00	METAL	18K	1%	1/4W	
R339	1-249-421-11	CARBON	2.2K	5%	1/4W	
R340	1-215-453-00	METAL	22K	1%	1/4W	
R341	1-215-421-00	METAL	1K	1%	1/4W	
R342	1-249-417-11	CARBON	1K	5%	1/4W	
R343	1-247-903-00	CARBON	1M	5%	1/4W	
R344	1-249-427-11	CARBON	6.8K	5%	1/4W	
R345	1-249-405-11	CARBON	100	5%	1/4W	
R347	1-249-405-11	CARBON	100	5%	1/4W	
R348	1-247-903-00	CARBON	1M	5%	1/4W	
R349	1-249-423-11	CARBON	3.3K	5%	1/4W	
R350	1-249-405-11	CARBON	100	5%	1/4W	
R351	1-215-447-00	METAL	12K	1%	1/4W	
R352	1-249-421-11	CARBON	2.2K	5%	1/4W	
R353	1-249-403-11	CARBON	68	5%	1/4W	F
R356	1-215-457-00	METAL	33K	1%	1/4W	
R360	1-249-423-11	CARBON	3.3K	5%	1/4W	

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RM-1271

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SONY
SERVICE MANUAL

AEP Model
Chassis No. SCC-D13C-A

60854

CORRECTION-1

File this correction with the service manual

INTRODUCTION

These following parts (IFB-11, RM-1271) are not subject of service, therefore delete from parts list.

☛ : Indicates corrected portion

Page 397: **8-3. C SHIELD BLOCK**

Incorrect				Correct			
REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
121	*A-1130-978-A	BC BOARD, COMPLETE		121 ☛	A-1130-978-A	BC BOARD, COMPLETE	
122	1-466-674-11	INTERFACE UNIT (IFB-11)		~~122~~	~~1-466-674-11~~	~~INTERFACE UNIT (IFB-11)~~	
123	*A-1135-692-A	BA BOARD, COMPLETE		123	*A-1135-692-A	BA BOARD, COMPLETE	
124	*3-673-948-11	CAP, DUST		124	*3-673-948-11	CAP, DUST	
125	4-374-303-01	RIVET, NYLON		125	4-374-303-01	RIVET, NYLON	

Page 447: **MISCELLANEOUS**

Incorrect				Correct			
REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
	⚠ 1-452-487-31	NECK ASS'Y, PICTURE TUBE (NA363A)			⚠ 1-452-487-31	NECK ASS'Y, PICTURE TUBE (NA363A)	
	⚠ 1-453-108-11	DC BLOCK, HIGH-VOLTAGE			⚠ 1-453-108-11	DC BLOCK, HIGH-VOLTAGE	
	⚠ 1-453-108-31	DC BLOCK, HIGH-VOLTAGE		☛	1-453-108-31	DC BLOCK, HIGH-VOLTAGE	
	1-466-674-11	INTERFACE UNIT (IFB-11)			~~1-466-674-11~~	~~INTERFACE UNIT (IFB-11)~~	
	1-503-255-00	SPEAKER			1-503-255-00	SPEAKER	

Page 447: **ACCESSORIES & PACKING MATERIALS**

Incorrect			Correct		
PART NO.	DESCRIPTION	REMARK	PART NO.	DESCRIPTION	REMARK
A-1470-928-A	COMMANDER ASS'Y (RM-1271)		☛ ~~A-1470-928-A~~	~~COMMANDER ASS'Y (RM-1271)~~	
*A-1280-414-A	RC BOARD, COMPLETE		*A-1280-414-A	RC BOARD, COMPLETE	

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VPH-1251QM
RM-1271

SONY®
SERVICE MANUAL

AEP Model
Serial No. 5,001,251 and later
Chassis No. SCC-D13C-A

SUPPLEMENT-2

File this supplement with the service manual.

INTRODUCTION

The version of the PROGRAM ROM (IC2) on Y board has changed.

NOTE)

When replacing IC2, part No. of the substrate has changed since above-mentioned serial No. of the set, and correspondence IC is differ, Each IC has no interchange ability so when installed it slipped up, please acknowledge that the set dose not operate.
Also please confirm part No. of IC, substrate and serial No. of the set when replacing it.

Serial No.	5,000,001～5,001,250	5,001,251 and later
Y BOARD, COMPLETE	A-1394-325-A	A-1394-325-B
Y BOARD PART No.	1-639-937-11 1-639-937-12	1-639-937-13
REFERENCE No. IC2	MBM27C512-20-PJY33A 8-759-173-96 (Labeled) 33A	MBM27C512-20-PJY034 8-759-163-66 (Labeled) 034

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